Owner's Manual

EcoGen 6kW Generator

c UL us LISTED

⚠ DANGER!

⚠ NOT INTENDED FOR USE IN CRITICAL LIFE SUPPORT APPLICATIONS.

⚠ ONLY QUALIFIED ELECTRICIANS OR CONTRACTORS SHOULD ATTEMPT INSTALLATION!

⚠ DEADLY EXHAUST FUMES! OUTDOOR INSTALLATION ONLY!

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INTRODUCTION

Thank you for purchasing this compact, high performance, air-cooled, engine-driven generator. It is designed to supply electrical power to operate an inverter/battery charger as a component in an off-grid power solution.

This unit is factory installed in an all-weather, metal enclosure and **is intended exclusively for outdoor installation.** This generator will operate using vapor withdrawn liquid propane (LP).

NOTE:

This generator is suitable for supplying typical residential loads such as Induction Motors (sump pumps, refrigerators, air conditioners, furnaces, etc.), Electronic Components (computer, monitor, TV, etc.), Lighting Loads and Microwaves.

READ THIS MANUAL THOROUGHLY

If any portion of this manual is not understood, contact the nearest Dealer for starting, operating and servicing procedures.

SAFETY RULES

Throughout this publication, and on tags and decals affixed to the generator, DANGER, WARNING, CAUTION and NOTE blocks are used to alert personnel to special instructions about a particular operation that may be hazardous if performed incorrectly or carelessly. Observe them carefully. Their definitions are as follows:

⚠ DANGER!

INDICATES A HAZARDOUS SITUATION OR ACTION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

⚠ WARNING!

Indicates a hazardous situation or action which, if not avoided, could result in death or serious injury.

⚠ CAUTION!

Indicates a hazardous situation or action which, if not avoided, could result in minor or moderate injury.

NOTE:

Notes contain additional information important to a procedure and will be found within the regular text body of this manual.

These safety warnings cannot eliminate the hazards that they indicate. Common sense and strict compliance with the special instructions while performing the action or service are essential to preventing accidents.

Four commonly used safety symbols accompany the **DANGER**, **WARNING** and **CAUTION** blocks. The type of information each indicates is as follows:

This symbol points out important safety information that, if not followed, could endanger personal safety and/or property of others.

This symbol points out potential explosion hazard.

This symbol points out potential fire hazard.

This symbol points out potential electrical shock hazard.

The operator is responsible for proper and safe use of the equipment. The manufacturer strongly recommends that the operator read this *Owner's Manual* and thoroughly understand all instructions before using this equipment. The manufacturer also strongly recommends instructing other users to properly start and operate the unit. This prepares them if they need to operate the equipment in an emergency.

CONTENTS

This manual contains important instructions that should be followed during installation and maintenance of the generator and batteries for the 6kW LP, V-twin GT-530 Engine.

OPERATION AND MAINTENANCE

It is the operator's responsibility to perform all safety checks, to make sure that all maintenance for safe operation is performed promptly, and to have the equipment checked periodically by a Dealer. Normal maintenance service and replacement of parts are the responsibility of the owner/operator and, as such, are not considered defects in materials or workmanship within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of the generator ensures a minimum number of problems and keep operating expenses at a minimum. See a Dealer for service aids and accessories.

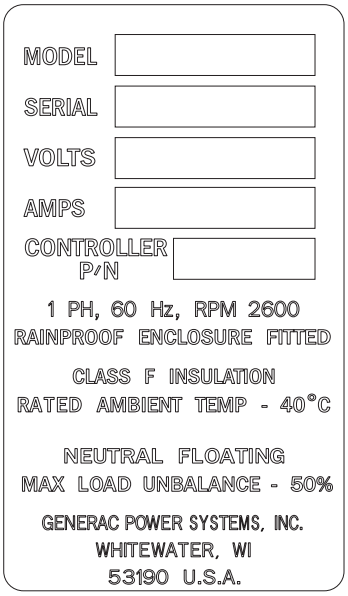
HOW TO OBTAIN SERVICE

When the generator requires servicing or repairs, contact a Dealer for assistance. Service technicians are factory-trained and are capable of handling all service needs.

When contacting a Dealer about parts and service, always supply the complete model number and serial number of the unit as given on its data decal, which is located on the generator. See section "The Generator" for decal location.

Model No. _____ Serial No._____

Data Label Sample



Safety Rules

IMPORTANT SAFETY INSTRUCTIONS! ***SAVE THESE INSTRUCTIONS – The manufacturer suggests that these rules for safe operation be copied and posted near the unit's installation site. Safety should be stressed to all operators and potential operators of this equipment.***

Study these SAFETY RULES carefully before installing, operating or servicing this equipment. Become familiar with this *Owner's Manual* and with the unit. The generator can operate safely, efficiently and reliably only if it is properly installed, operated and maintained. Many accidents are caused by failing to follow simple and fundamental rules or precautions.

The manufacturer cannot anticipate every possible circumstance that might involve a hazard. The warnings in this manual, and on tags and decals affixed to the unit are, therefore, not all-inclusive. If using a procedure, work method or operating technique the manufacturer does not specifically recommend, ensure that it is safe for others. Also make sure the procedure, work method or operating technique utilized does not render the generator unsafe.

⚠ DANGER!

Despite the safe design of this generator, operating this equipment imprudently, neglecting its maintenance or being careless can cause possible injury or death. Permit only responsible and capable persons to install, operate and maintain this equipment.

Potentially lethal voltages are generated by these machines. Ensure all steps are taken to render the machine safe before attempting to work on the generator.

Parts of the generator are rotating and/or hot during operation. Exercise care near running generators.

Installation must always comply with applicable codes, standards, laws and regulations.

A running generator gives off carbon monoxide, and odorless, colorless poison gas. Breathing in carbon monoxide can cause headaches, fatigue, diziness, nausea, vomitting, confusion, fainting, siezures or death.

GENERAL HAZARDS

- For safety reasons, the manufacturer recommends that this equipment be installed, serviced and repaired by a Service Dealer or other competent, qualified electrician or installation technician who is familiar with applicable codes, standards and regulations. The operator also must comply with all such codes, standards and regulations.
- The engine exhaust fumes contain carbon monoxide, which can be DEADLY. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. Do NOT alter or add to the exhaust system or do anything that might render the system unsafe or in noncompliance with applicable codes and standards.
- Install a battery operated carbon monoxide alarm indoors, according to manufacturer's instructions/recommendations.
- Adequate, unobstructed flow of cooling and ventilating air is critical to correct generator operation. Do not alter the installation or permit even partial blockage of ventilation provisions, as this can seriously affect safe operation of the generator. **The generator MUST be installed and operated outdoors only.**
- Keep hands, feet, clothing, etc., away from drive belts, fans, and other moving or hot parts. Never remove any drive belt or fan guard while the unit is operating.
- When working on this equipment, remain alert at all times. Never work on the equipment when physically or mentally fatigued.
- Inspect the generator regularly, and contact the nearest Dealer for parts needing repair or replacement.
- Before performing any maintenance on the generator, disconnect its battery cables to prevent accidental start up. Disconnect the cable from the battery post indicated by a NEGATIVE, NEG or (–) first, then remove the POSITIVE, POS or (+) cable. When reconnecting the cables, connect the POSITIVE cable first, the NEGATIVE cable last.
- Never use the generator or any of its parts as a step. Stepping on the unit can stress and break parts, and may result in dangerous operating conditions from leaking exhaust gases, fuel leakage, oil leakage, etc.

EXHAUST HAZARDS

- Generator engine exhaust contains DEADLY carbon monoxide, an odorless, colorless poisonous gas. Breathing carbon monoxide can cause: dizziness, throbbing temples, nausea, muscular twitching, headache, vomiting, weakness and sleepiness, inability to think clearly, fainting, unconsciousness or even death. If you experience any carbon monoxide poisoning symptoms, move into fresh air and immediately seek medical attention.
- Never operate the generator set with the vehicle inside any garage or other enclosed area.

ELECTRICAL HAZARDS

- All generators covered by this manual produce dangerous electrical voltages and can cause fatal electrical shock. Utility power delivers extremely high and dangerous voltages to the transfer switch as does the standby generator when it is in operation. Avoid contact with bare wires, terminals, connections, etc., while the unit is running. Ensure all appropriate covers, guards and barriers are in place, secured and/or locked before operating the generator. If work must be done around an operating unit, stand on an insulated, dry surface to reduce shock hazard.
- Do not handle any kind of electrical device while standing in water, while barefoot, or while hands or feet are wet. DANGEROUS ELECTRICAL SHOCK MAY RESULT.

- The National Electrical Code (NEC) requires the frame and external electrically conductive parts of the generator to be connected to an approved earth ground. Local electrical codes also may require proper grounding of the generator electrical system.
- After installing this home standby electrical system, the generator may crank and start at any time without warning. When this occurs, load circuits are transferred to the STANDBY (generator) power source. To prevent possible injury if such a start and transfer occur, always set the generator's AUTO/OFF/MANUAL switch to its OFF position before working on equipment and remove the 7.5A fuse from the generator control panel.
- In case of accident caused by electric shock, immediately shut down the source of electrical power. If this is not possible, attempt to free the victim from the live conductor. AVOID DIRECT CONTACT WITH THE VICTIM. Use a nonconducting implement, such as a dry rope or board, to free the victim from the live conductor. If the victim is unconscious, apply first aid and get immediate medical help.
- Never wear jewelry when working on this equipment. Jewelry can conduct electricity resulting in electric shock, or may get caught in moving components causing injury.

FIRE HAZARDS

- For fire safety, the generator must be installed and maintained properly. **Installation must always comply with applicable codes, standards, laws and regulations.** Adhere strictly to local, state and national electrical and building codes. Comply with regulations the Occupational Safety and Health Administration (OSHA) has established. Also, ensure that the generator is installed in accordance with the manufacturer's instructions and recommendations. Following proper installation, do nothing that might alter a safe installation and render the unit in noncompliance with the aforementioned codes, standards, laws and regulations.
- Keep a fire extinguisher near the generator at all times. Extinguishers rated "ABC" by the National Fire Protection Association are appropriate for use on the standby electric system. Keep the extinguisher properly charged and be familiar with its use. Consult the local fire department with any questions pertaining to fire extinguishers.

EXPLOSION HAZARDS

- Do not smoke around the generator. Wipe up any fuel or oil spills immediately. Ensure that no combustible materials are left in the generator compartment, or on or near the generator, as FIRE or EXPLOSION may result. Keep the area surrounding the generator clean and free from debris.
- Gaseous fluids such as natural gas and liquid propane (LP) gas are extremely EXPLOSIVE. Install the fuel supply system according to applicable fuel-gas codes. Before placing the home standby electric system into service, fuel system lines must be properly purged and leak tested according to applicable code. After installation, inspect the fuel system periodically for leaks. No leakage is permitted.

STANDARDS INDEX

In the absence of pertinent standards, codes, regulations and laws, the published information listed below may be used for installation guidance for this equipment.

1. NFPA No. 37, STATIONARY COMBUSTION ENGINES AND GAS TURBINES, available from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
2. NFPA No. 76A, ESSENTIAL ELECTRICAL SYSTEMS FOR HEALTH CARE FACILITIES, available same as Item 1.
3. NFPA No. 54, NATIONAL FUEL GAS CODE, available same as Item 1.
4. NFPA No. 58, AMERICAN NATIONAL STANDARD FOR STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GAS, available same as Item 1.
5. NFPA No. 70, NFPA HANDBOOK OF NATIONAL ELECTRIC CODE, available same as Item 1.
6. Article X, NATIONAL BUILDING CODE, available from the American Insurance Association, 85 John Street, New York, N.Y. 10038.
7. AGRICULTURAL WIRING HANDBOOK, available from the Food and Energy Council, 909 University Avenue, Columbia, MO 65201.
8. ASAE EP-3634, INSTALLATION AND MAINTENANCE OF FARM STANDBY ELECTRICAL SYSTEMS, available from the American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085.
9. NFPA No. 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE, available same as Item 1.

CALIFORNIA PROPOSITION 65 WARNING

Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

CALIFORNIA PROPOSITION 65 WARNING

This product contains or emits chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

⚠ DANGER!

⚠ Only qualified electricians or contractors should attempt such installations, which must comply strictly with applicable codes, standards and regulations.

1.1 UNPACKING/INSPECTION

After unpacking, carefully inspect the contents for damage.

- This standby generator set is ready for installation with a factory supplied and pre-mounted base pad and has a weather protective enclosure that is intended for **outdoor installation only.**

⚠ WARNING!

⚠ If this generator is used to power electrical load circuits normally powered by a utility power source, it is required by code to install a transfer switch. The transfer switch must effectively isolate the electrical system from the utility distribution system when the generator is operating (NEC 700, 701 & 702). Failure to isolate an electrical system by such means will result in damage to the generator and also may result in injury or death to utility power workers due to backfeed of electrical energy.

If any loss or damage is noted at time of delivery, have the person(s) making the delivery note all damage on the freight bill or affix their signature under the consignor's memo of loss or damage.

If a loss or damage is noted after delivery, separate the damaged materials and contact the carrier for claim procedures.

“Concealed damage” is understood to mean damage to the contents of a package that is not in evidence at the time of delivery, but is discovered later.

To properly open the roof, press down on the center top lip and turn the locks on both ends. If pressure is not applied from the top, the roof may appear stuck. Always verify that the side locks are unlocked before attempting to lift the roof.

1.2 PROTECTION SYSTEMS

Unlike an automobile engine, the generator may have to run for long periods of time with no operator present to monitor engine conditions. For that reason, the engine is equipped with the following systems that protect it against potentially damaging conditions:

1. Low Oil Pressure Sensor
2. High Temperature Sensor
3. Overcrank
4. Overspeed
5. RPM Sensor
6. Low Battery
7. Under-frequency
8. Undervoltage
9. Overvoltage
10. Internal Failure

There are readouts on the control panel to notify personnel that one of these failures has occurred. There is a Status message on the display that displays when all of the conditions described in the "Ready to Run" section are true.

1.3 EMISSION INFORMATION

The Environmental Protection Agency requires that this generator comply with exhaust emission standards. This generator is certified to meet the applicable EPA emission levels. Additional information regarding the requirements set by the EPA is as follows:

The generator is certified for use as a stationary engine for standby power generation. Any other use may be a violation of federal and/or local laws. It is important to follow the maintenance specifications in the "Maintenance" section to ensure that the engine complies with the applicable emission standards for the duration of the engine’s life. This engine is certified to operate on Liquid Propane fuel. The emission control system on the generator consists of the following:

- Fuel Metering System
  - Carburetor/mixer assembly
  - Fuel regulator
- Air Induction System
  - Intake pipe/manifold
  - Air cleaner
- Ignition System
  - Spark plug
  - Ignition module

The Emissions Compliance Period referred to on the Emissions Compliance Label indicates the number of operating hours for which the engine has been shown to meet Federal emission requirements. See the table below to determine the compliance period for the generator. The displacement of the generator is listed on the Emissions Compliance Label.

Displacement	Category	Compliance Period
< 66 cc	A	300 Hours
	B	125 Hours
	C	50 Hours
≥ 66 cc - < 225 cc	A	500 Hours
	B	250 Hours
	C	125 Hours
≥ 225 cc	A	1000 Hours
	B	500 Hours
	C	250 Hours

1.4 THE GENERATOR

Figure 1.1 – 6kW, V-twin, GT-530 Engine (door removed)

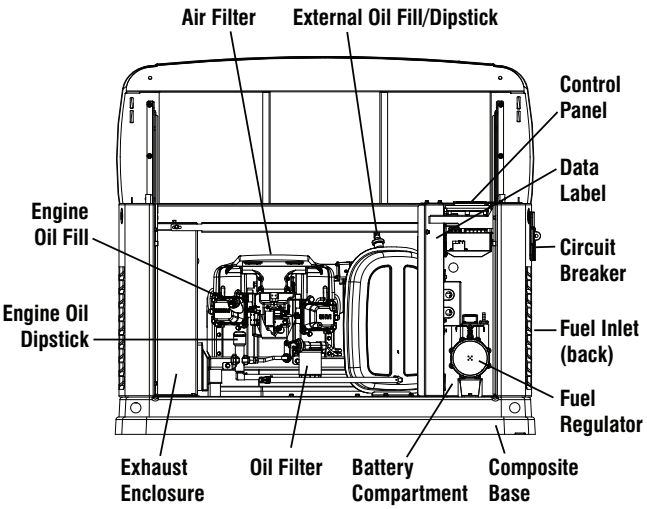
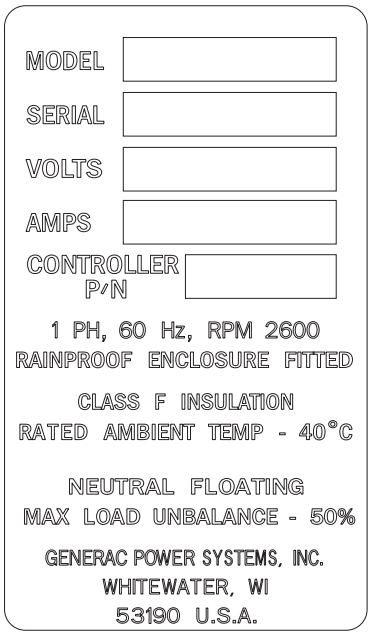


Figure 1.2 – Data Label Sample



1.5 SPECIFICATIONS

1.5.1 GENERATOR

Fuel Type	LP vapor only
Rated Voltage	120 VAC
Rated Maximum Load Current (Amps) at 120 Volts (LP)*	50.0
Main Circuit Breaker	50 Amp
Phase	1
Number of Rotor Poles	2
Rated AC Frequency	60 Hz
Battery Requirement	Group 26R, 12 Volts and 525 CCA Minimum
Weight (unit only in lbs.)	387
Enclosure	Steel

Normal Operating Range: This unit is tested in accordance to UL 2200 standards with an operating temperature of 20 °F (-29 °C) to 122 °F. (50 °C). For areas where temperatures fall below 32 °F (0 °C), a cold weather kit is highly recommended. When operated above 104º F (40º C) there may be a decrease in engine power. (Please reference the engine specifications section).

These generators are rated in accordance with UL2200, Safety Standard for Stationary Engine Generator Assemblies; and CSA-C22.2 No. 100-04 Standard for Motors and Generators.

1.5.2 ENGINE

Type of Engine	GT-530
Number of Cylinders	2
Rated Horsepower @ 3,600 rpm*	18
Displacement	530cc
Cylinder Block	Aluminum w/Cast Iron Sleeve
Valve Arrangement	Overhead Valves
Ignition System	Solid-state w/Magneto
Recommended Spark Plug	BPR6HS
Spark Plug Gap	0.76 mm (0.030 inch)
Compression Ratio	9.5:1
Starter	12 VDC
Oil Capacity Including Filter	Approx. 1.7 Qts
Recommended Oil Filter	Part # 070185F
Recommended Air Filter	Part # 0E9371
Operating RPM	2,600

* Engine power is subject to and limited by such factors as fuel Btu content, ambient temperature and altitude. Engine power decreases about 3.5 percent for each 1,000 feet above sea level; and also will decrease about 1 percent for each 6 C (10 F) above 16 C (60 F) ambient temperature.

1.6 READY TO RUN

The "Ready to Run" on the display is ready when all of the following conditions are true:

1. The AUTO/OFF/MANUAL switch is set to the AUTO position.
2. The utility voltage being supplied to the unit is being sensed by the PCB. If the utility sense voltage is not connected to the unit or if it is below approximately 150-160 volts AC, then the system will display the message "No Utility Present". This indicates that if the AUTO/OFF/MANUAL switch is placed in the Auto position, the generator will start.
3. No alarms are present, for example, low oil pressure, high temperature, etc.

1.7 FUEL REQUIREMENTS AND RECOMMENDATIONS

This unit uses a LP vapor withdrawal system only. This type of system uses the vapors formed above the liquid fuel in the storage tank.

Recommended fuels should have a Btu content of at least 2,520 Btus per cubic foot for LP gas. Ask the fuel supplier for the Btu content of the fuel.

Required fuel pressure for **liquid propane, 10 inches to 12 inches of water column (0.36 to 0.43 psi). The primary regulator for the propane supply is NOT INCLUDED with the generator.**

NOTE:

All pipe sizing, construction and layout must comply NFPA 58 for liquid propane applications. Once the generator is installed, verify that the fuel pressure NEVER drops below 10 inches water column.

Prior to installation of the generator, the installer should consult local fuel suppliers or the fire marshal to check codes and regulations for proper installation. Local codes will mandate correct routing of gaseous fuel line piping around gardens, shrubs and other landscaping to prevent any damage.

Special considerations should be given when installing the unit where local conditions include flooding, tornados, hurricanes, earthquakes and unstable ground for the flexibility and strength of piping and their connections.

Use an approved pipe sealant or joint compound on all threaded fitting.

All installed gaseous fuel piping must be purged and leak tested prior to initial start-up in accordance with local codes, standards and regulations.

1.8 FUEL CONSUMPTION

Unit	LP Vapor	
	1/2 Load	Full Load
6 kW	0.82/30	1.47/54

** LP is in gallons per hour/cubic feet per hour.

*** Values given are approximate.

Verify that gas pipe and regulator is capable of providing enough fuel flow to include household appliances.

⚠ DANGER!

Gaseous fuels such as liquid propane (LP) gas are highly explosive. Even the slightest spark can ignite fuel and cause an explosion. No leakage of fuel is permitted. LP gas is heavier than air and tends to settle in low areas.

NOTE:

A minimum of one approved manual shut-off valve must be installed in the gaseous fuel supply line. The valve must be easily accessible. Local codes determine the proper location.

1.9 LOCATION

⚠ DANGER!

The engine exhaust fumes contain carbon monoxide, which can be DEADLY. This dangerous gas, if breathed in sufficient concentrations, can cause unconsciousness or even death. This generator must be installed properly, in strict compliance with applicable codes and standards. Following installation, do nothing that might render the system unsafe or in noncompliance with such codes and standards.
Operate the generator outdoors ONLY.

- **Keep exhaust gases from entering a confined area through windows, doors, ventilation, crawl spaces or other openings (Figure 1.3).**
- **It is highly recommended that carbon monoxide detector(s) be installed indoors according to the manufacturer's instructions/recommendations.**
- **The generator must me mounted safely per applicable codes and the manufacturer's specifications. Do NOT alter or add to the exhaust system, or do anything that might render the exhaust system unsafe or in noncompliance with applicable codes and standards.**

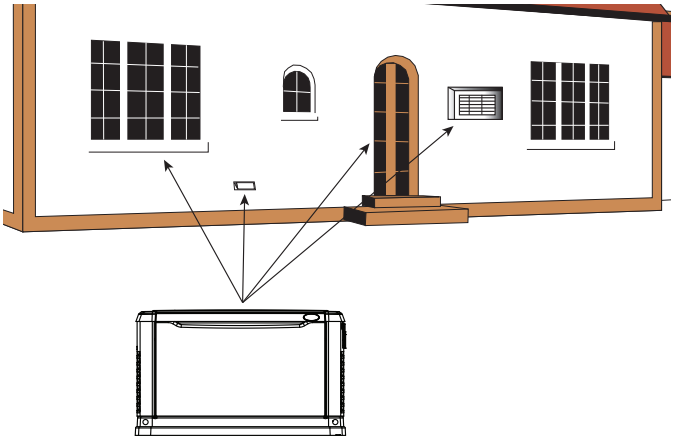
1.9.1 GENERATOR

Install the generator set, in its protective enclosure, **outdoors**, where adequate cooling and ventilating air is always available (Figure 1.3). Consider these factors:

- The installation of the generator **must comply strictly with NFPA 37, NFPA 58, and NFPA 70 standards.**
- Install the unit where air inlet and outlet openings will not become obstructed by leaves, grass, snow, etc.. If prevailing winds will cause blowing or drifting, consider using a windbreak to protect the unit.
- Install the generator on high ground where water levels will not rise and endanger it.
- Allow sufficient room on all sides of the generator for maintenance and servicing. This unit must be installed in accordance with current applicable NFPA 37 and NFPA 70 standards; as well as any other federal, state and local codes for minimum distances from other structures. DO NOT install under wooden decks or structures unless there is at least four (4) feet of clearance above the generator, three (3) feet of clearance on sides and front, and 18 inches of clearance at back of unit.
- Install the unit where rain gutter down spouts, roof run-off, landscape irrigation, water sprinklers or sump pump discharge does not flood the unit or spray the enclosure, including any air inlet or outlet openings.

- Install the unit where services will not be affected or obstructed, including concealed, underground or covered services such as electrical, fuel, phone, air conditioning or irrigation.
- Where strong prevailing winds blow from one direction, face the generator air inlet openings to the prevailing winds.
- Install the generator as close as possible to the fuel supply, to reduce the length of piping.
- Install the generator as close as possible to the transfer switch. REMEMBER THAT LAWS OR CODES MAY REGULATE THE DISTANCE AND LOCATION.
- The genset must be installed on a level surface. The base frame must be level within two (2) inches all around.
- The generator is typically placed on pea gravel or crushed stone. Check local codes if a concrete slab is required. If a concrete base slab is required, all federal, state and local codes should be followed. Special attention should be given to the concrete base slab which should exceed the length and width of the generator by a minimum of six (6) inches (0.152 meters) on all sides.

Figure 1.3 – Generator Clearances



1.9.2 NEW INSTALLATION GUIDELINES FOR STATIONARY AIR-COOLED GENERATORS

The National Fire Protection Association has a standard for the installation and use of stationary combustion engines. That standard is NFPA 37 and its requirements limit the spacing of an enclosed generator set from a structure or wall (Figure 1.4).

NFPA 37, Section 4.1.4, Engines Located Outdoors. Engines, and their weatherproof housings if provided, that are installed outdoors shall be located at least 5 ft. from openings in walls and at least 5 ft. from structures having combustible walls. A minimum separation shall not be required where the following conditions exist:

1. The adjacent wall of the structure has a fire resistance rating of at least 1 hour.
2. The weatherproof enclosure is constructed of noncombustible materials and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure.

Annex A — Explanatory Material

A4.1.4 (2) Means of demonstrating compliance are by means of full scale fire test or by calculation procedures.

Because of the limited spaces that are frequently available for installation, it has become apparent that exception (2) would be beneficial for many residential and commercial installations. With that in mind, the manufacturer contracted with an independent testing laboratory to run full scale fire tests to assure that the enclosure would not ignite combustible materials outside the enclosure.

The criteria was to determine the worst case fire scenario within the generator and to determine the ignitability of items outside the engine enclosure at various distances. The enclosure is constructed of non-combustible materials and the results and conclusions from the independent testing lab indicated that any fire within the generator enclosure would not pose any ignition risk to nearby combustibles or structures, with or without fire service personnel response.

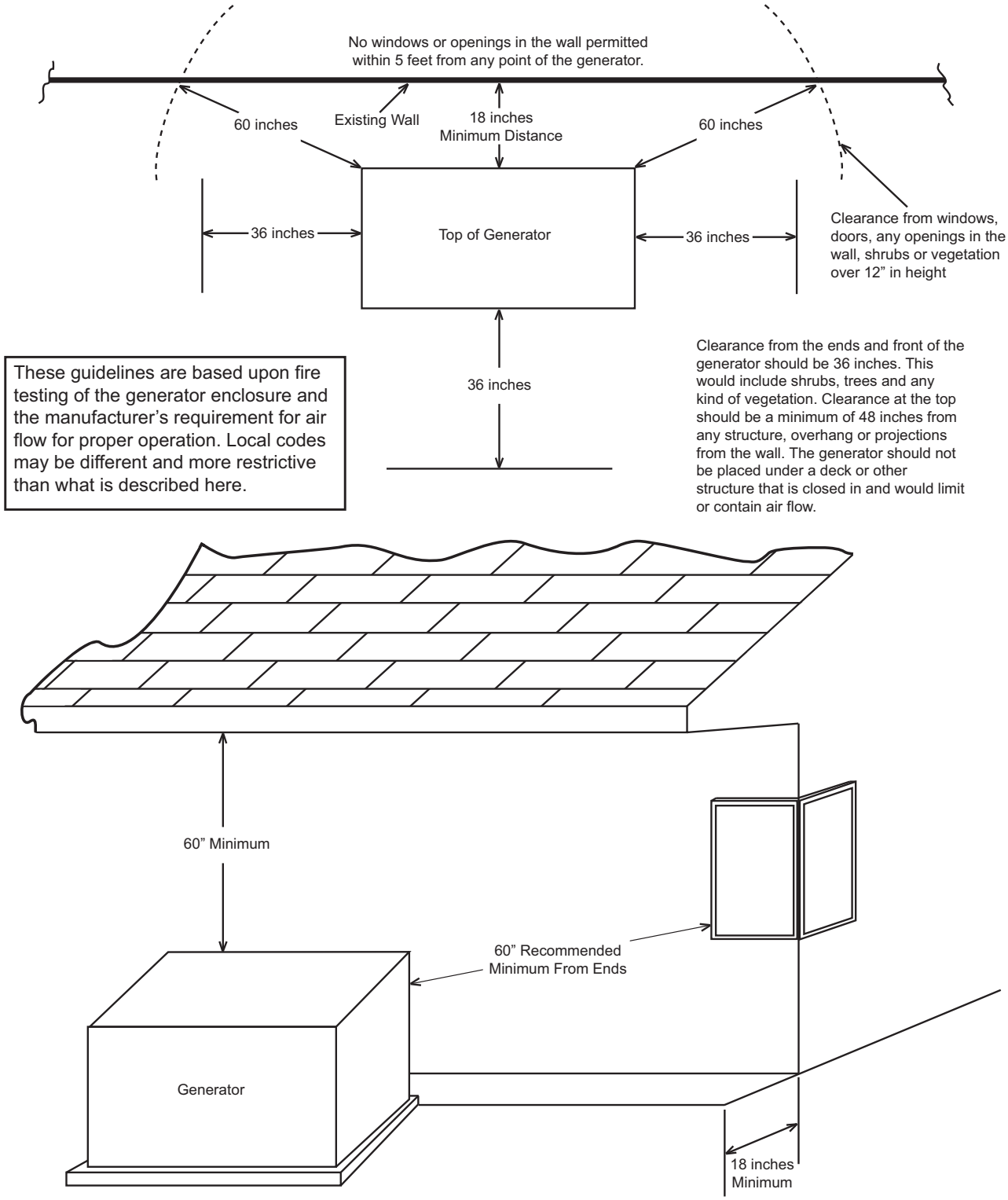
Based on this testing and the requirements of NFPA 37, Sec 4.1.4, the guidelines for installation of the generators listed above are changed to 18 inches (457mm) from the back side of the generator to a stationary wall or building. For adequate maintenance and airflow clearance, the area above the generator should be at least 4 feet with a minimum of 3 feet at the front and ends of the enclosure. This would include trees, shrubs and vegetation that could obstruct airflow. See the diagram on the reverse of this page and the installation drawing within the owner's manual for details.

Generator exhaust contains DEADLY carbon monoxide gas. This dangerous gas can cause unconsciousness or death. Do not place the unit near windows, doors, fresh air intakes (furnaces, etc.) or any openings in the building or structure, including windows and doors of an attached garage.

⚠ WARNING!

If the AUTO/OFF/MANUAL switch is not set to its OFF position, the generator can crank and start as soon as the battery cables are connected. If the battery charger power supply is not turned off, sparking can occur at the battery posts and cause an explosion.

Figure 1.4 – Installation Guidelines


No windows or openings in the wall permitted
within 5 feet from any point of the generator.
60 inches
Existing Wall
18 inches
Minimum Distance
60 inches
36 inches
Top of Generator
36 inches
Clearance from windows,
doors, any openings in the
wall, shrubs or vegetation
over 12” in height
36 inches
These guidelines are based upon fire testing of the generator enclosure and the manufacturer’s requirement for air flow for proper operation. Local codes may be different and more restrictive than what is described here.
Clearance from the ends and front of the generator should be 36 inches. This would include shrubs, trees and any kind of vegetation. Clearance at the top should be a minimum of 48 inches from any structure, overhang or projections from the wall. The generator should not be placed under a deck or other structure that is closed in and would limit or contain air flow.
60” Minimum
60” Recommended
Minimum From Ends
Generator
18 inches
Minimum

This drawing supersedes installation instructions in all air-cooled installation and owner's manuals dated previous to May 26, 2007.

1.10 BATTERY REQUIREMENTS

See the Specifications section for correct battery size and rating.

1.11 BATTERY INSTALLATION

Fill the battery with the proper electrolyte fluid if necessary and have the battery fully charged before installing it.

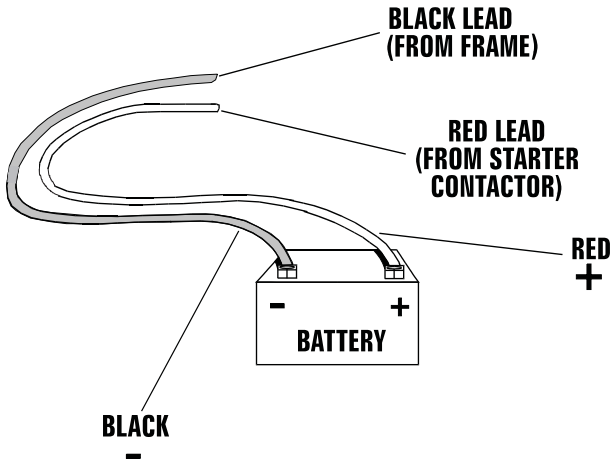
Before installing and connecting the battery, complete the following steps:

1. Set the generator's AUTO/OFF/MANUAL switch to OFF.
2. Turn off utility power supply to the transfer switch.
3. Remove the 7.5A fuse from the generator control panel.

Battery cables were factory connected at the generator (Figure 1.5). Connect cables to battery posts as follows:

4. Connect the red battery cable (from starter contactor) to the battery post indicated by a positive, POS or (+).
5. Connect the black battery cable (from frame ground) to the battery post indicated by a negative, NEG or (—).
6. Install battery post covers supplied with the generator.

Figure 1.5 – Battery Cable Connections



NOTE:

Dielectric grease should be used on battery posts to aid in the prevention of corrosion.

NOTE:

Damage will result if battery connections are made in reverse.

NOTE:

In areas where temperatures regularly fall below 32° F (0° C) it is recommended that a pad type battery heater be installed to aid in cold climate starting.

1.12 THE BATTERY

⚠ DANGER!

Do not dispose of the battery in a fire. The battery is capable of exploding.

A battery presents a risk of electrical shock and high short circuit current. The following precautions are to be observed when working on batteries:

- **Remove the 7.5A fuse from the generator control panel.**
- **Remove watches, rings or other metal objects.**
- **Use tools with insulated handles.**
- **Wear rubber gloves and boots.**
- **Do not lay tools or metal parts on top of the battery.**
- **Disconnect charging source prior to connecting or disconnecting battery terminals.**

⚠ WARNING!

Do not open or mutilate the battery. Released electrolyte has been known to be harmful to the skin and eyes, and to be toxic.

The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive.

The following procedures are to be observed:

- **Wear full eye protection and protective clothing.**
- **Where electrolyte contacts the skin, wash it off immediately with water.**
- **Where electrolyte contacts the eyes, flush thoroughly and immediately with water and seek medical attention.**
- **Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of 1 pound (500 grams) bicarbonate of soda to 1 gallon (4 liters) of water. The bicarbonate of soda solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water and the area dried.**

Lead-acid batteries present a risk of fire because they generate hydrogen gas. The following procedures are to be followed:

- **DO NOT SMOKE when near the battery.**
- **DO NOT cause flame or spark in battery area.**
- **Discharge static electricity from body before touching the battery by first touching a grounded metal surface.**

Be sure the AUTO/OFF/MANUAL switch is set to the OFF position before connecting the battery cables. If the switch is set to AUTO or MANUAL, the generator can crank and start as soon as the battery cables are connected.

Be sure the utility power supply is turned off and the 7.5A fuse is removed from the generator control panel, or sparking may occur at the battery posts as the cables are attached and cause an explosion.

Servicing of the battery is to be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.

See the Specifications section for the correct size and rating when replacing the battery. Have these procedures performed at the intervals specified in the “Service Schedule.” A negative ground system is used. Battery connections are shown on the wiring diagrams. Make sure the battery is correctly connected and terminals are tight. Observe battery polarity when connecting the battery to the generator set.

1.13 BATTERY CHARGER

NOTE:

The battery charger is integrated into the control module in all models and requires input to the generator between 90-265VAC.

It operates as a "Smart Charger" which ensures output is continually optimized to promote maximum battery life and charging levels are at safe conditions. The user can monitor both battery voltage and current charge in both "Boost" and "Float" modes on the LCD display on the controller.

NOTE:

There is a warning on the LCD display when the battery needs service.

2.1 ACTIVATE THE GENERATOR

When battery power is applied to the generator during the installation process, the controller will light up. However, the generator still needs to be activated before it will automatically run in the event of a power outage.

Activating the generator is a simple one time process that is guided by the controller screen prompts. Once the product is activated, the controller screen will not prompt you again, even if you disconnect the generator battery.

After obtaining your activation code, please complete the following steps at the generator’s control panel in the Activation Chart.

2.2 BEFORE INITIAL START-UP

NOTE:

These units have been run and tested at the factory prior to being shipped and do not require any type of break-in.

NOTE:

This unit comes filled with oil from the factory. Check the oil level and add the appropriate amount if necessary.

Before starting, complete the following:

1. Set the generator’s main circuit breaker to its OFF (or OPEN) position.
2. Set the generator's AUTO/OFF/MANUAL switch to the OFF position.
3. Turn OFF all breakers on the load center of the transfer box (T1 and T2).
4. Turn OFF all loads connected to the transfer switch terminals T1 and T2.
5. Check the engine crankcase and reservior oil level and, if necessary, fill to the dipstick FULL mark with the recommended oil. Do not fill above the FULL mark.
6. Check the fuel supply. Gaseous fuel lines must have been properly purged and leak tested in accordance with applicable fuel-gas codes. All fuel shutoff valves in the fuel supply lines must be open.

During initial start up only, the generator may exceed the normal number of start attempts and experience an “over crank” fault (See the "Overcrank" section). This is due to accumulated air in the fuel system during installation. Reset the control board and restart up to two more times, if necessary. If unit fails to start, contact the local dealer for assistance.

⚠ CAUTION!

Never operate the engine with the oil level below the “Add” mark on the dipstick. Doing this could damage the engine.

2.3 ELECTRICAL CHECKS

Complete electrical checks as follows:

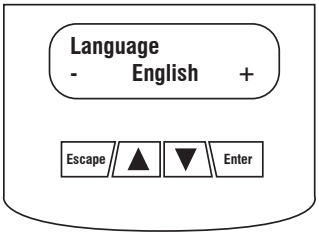
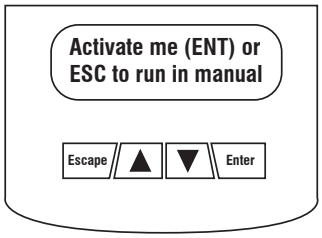
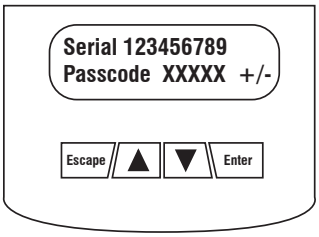
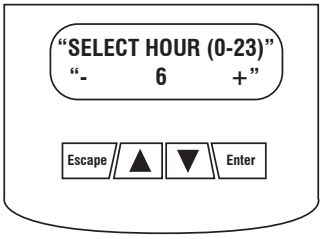
1. Set the generator's main circuit breaker to its OFF (or OPEN) position.
2. Set the generator's AUTO/OFF/MANUAL switch to the OFF position.
3. Turn on the battery charger power supply to the generator using the means provided (such as a utility main line circuit breaker).

⚠ DANGER!

The generator is now electrically “hot.” Contact with “hot” parts will result in extremely hazardous and possibly fatal electrical shock. Proceed with caution.

4. Check battery charger power source voltage across terminals T1 and the transfer switch neutral lug; then across terminal neutral. Nominal line-to-neutral voltage should be 120 volts AC.

ACTIVATION CHART

CHOOSE LANGUAGE		**TROUBLESHOOTING**
Display Reads: 	Use ARROW keys to scroll to desired language. Press ENTER to select.	If the wrong language is chosen, it can be changed later using the “edit” menu.
Display Reads: 	Press ENTER to begin the activation process.	If ESCAPE is pressed instead of ENTER, your generator will only run in manual mode (for test purposes) and NOT ACTIVATED will be displayed. You will need to reconnect the battery and begin with Step 1.
Display Reads: 	If you do not have your activation code, go to www.activategen.com or call 1-888-9ACTIVATE (922-8482). If you already have your activation code, wait 3-5 seconds for the next display.	
ENTER ACTIVATION CODE (Passcode)		**TROUBLESHOOTING**
Display Reads: 	Use ARROW keys to scroll and find the first number of your Activation Code. Press ENTER to select. Repeat this step until all digits have been entered. Use ESCAPE to correct previous digits.	
Display Reads: 	Activation is complete when all digits are entered above and your screen shows this display. Follow the controller prompts to continue setting the time function. Refer to your Owner’s Manual with questions.	What happens if “Wrong Passcode Try Again” appears? Reenter the activation code. If a second attempt is unsuccessful, check the number against the code given on activategen.com. If it is correct and the generator will not accept it, contact 1-888-9ACTIVATE (922-8482).

5. When certain that input voltage is compatible with battery charger ratings, turn OFF the power supply to the generator.
6. On the generator panel, set the Auto/Off/ Manual switch to MANUAL. The engine should crank and start.
7. Let the engine warm up for about five minutes to allow internal temperatures to stabilize. Then, set the generator's main circuit breaker to its ON (or closed) position.

⚠ DANGER!

⚠ Proceed with caution! Generator power voltage is now supplied to the inverter. Contact with live inverter parts will result in dangerous and possibly fatal electrical shock.

8. Connect the AC voltmeter test leads across terminal lugs E1 and neutral. Voltage reading should be 125-120 volts AC.
9. Set the generator's main circuit breaker to its OFF (or OPEN) position. Let the engine run at no-load for a few minutes to stabilize internal engine generator temperatures.
10. Set the generator's AUTO/OFF/MANUAL switch to OFF. The engine should shut down.

NOTE:

It is important not to proceed until certain that generator AC voltage and frequency are correct and within the stated limits.

2.4 GENERATOR TESTS UNDER LOAD

To test the generator set with electrical loads applied, proceed as follows:

1. Set generator's main circuit breaker to its OFF (or OPEN) position.
2. Turn OFF all breakers on the load center of the inverter (if equipped).
3. Set the generator's AUTO/OFF/MANUAL switch to MANUAL. The engine should crank and start immediately.
4. Let the engine stabilize and warm up for a few minutes.
5. Set the generator's main circuit breaker to its ON (or CLOSED) position. The inverter is now powered by the standby generator.
6. Turn ON the load center of the inverter system.
7. Connect an accurate AC voltmeter and a frequency meter across terminal lugs at the inverter.
   - Voltage should be greater than 120 volts and frequency should be 60 Hz.
8. Let the generator run at full rated load for 20-30 minutes. Listen for unusual noises, vibration or other indications of abnormal operation. Check for oil leaks, evidence of overheating, etc.
9. When testing under load is complete, turn OFF electrical loads.
10. Set the generator's main circuit breaker to its OFF (or OPEN) position.
11. Let the engine run at no-load for a few minutes.
12. Set the AUTO/OFF/MANUAL switch to OFF. The engine should shut down.

2.5 CHECKING AUTOMATIC OPERATION

To check the system for proper automatic operation, proceed as follows:

1. Set generator's main circuit breaker to its OFF (or OPEN) position.
2. Check that the AUTO/OFF/MANUAL switch is set to OFF.
5. Turn ON the power supply to the battery charger, using the means provided (such as a line circuit breaker).
6. Set the generator's main circuit breaker to its ON (or CLOSED) position.
7. Set the AUTO/OFF/MANUAL switch to AUTO. The system is now ready for automatic operation.
8. Close or connect Remote 2-wire Start with a test switch installed at the inverter.

With the AUTO/OFF/MANUAL switch at AUTO, the engine should crank and start when the remote start contact switch is closed. Let the system go through its entire automatic sequence of operation.

With the generator running and loads powered by generator AC output, and the remote start contacts OPEN. The following should occur:

- About one minute after remote start contacts OPEN (OFF) the engine should shut down.

3.1 CONTROL PANEL INTERFACE

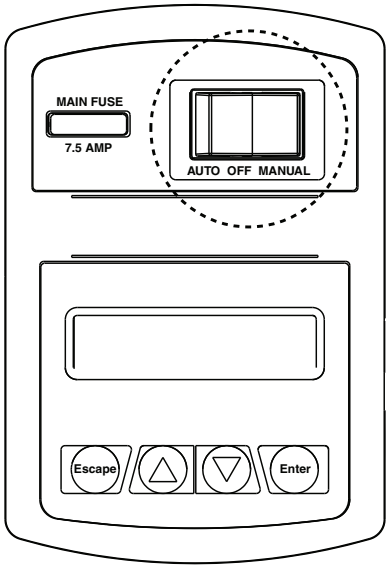
3.1.1 USING THE AUTO/OFF/MANUAL SWITCH (FIGURE 3.1)

⚠ WARNING!

⚠ With the switch set to AUTO, the engine may crank and start at any time without warning. Such automatic starting occurs when utility power source voltage droops below a preset level or during the normal exercise cycle. To prevent possible injury that might be caused by such sudden starts, always set the switch to OFF and remove the fuses before working on or around the generator or transfer switch. Then, place a "DO NOT OPERATE" tag on the generator panel and on the transfer switch.

1. "AUTO" Position – Selecting this switch activates fully automatic system operation.
2. "OFF" Position – This switch position shuts down the engine. This position also prevents automatic operation.
3. "MANUAL" Position – Set the switch to MANUAL to crank and start the engine. Transfer to standby power will not occur unless there is a utility failure.

Figure 3.1 – Generator Control Panel



Upon first power up of the generator, the display interface will begin an installation assistant. The assistant will prompt the user to set the minimum settings to operate. These settings are Current Date/Time. The maintenance intervals will be initialized when the exercise time is entered (Figure 3.1).

If the 12 volt battery is disconnected or the fuse removed, the Installation Assistant will operate upon power restoration. The only difference is the display will only prompt the customer for the current Time and Date.

NOTE:

The current date/time will need to be reset every time the 12 volt battery is disconnected and then reconnected, and/or when the fuse is removed.

Display Interface Menus

The LCD display is organized as detailed below:

- The “Home” page, this page is the default page which will be displayed if no keys are pressed for 30 seconds. This page normally shows the current Status message and the current date and time. The highest priority active Alarm and/or Warning will be automatically posted on this page as well as flashing the backlight when such an event is detected. In the case of multiple Alarms or Warnings, only the first message will be displayed. To clear an Alarm or Warning, see the Protection Systems section - Clear Alarm.
- The display backlight is normally off. If the user presses any key, the backlight will come on automatically and remain on for 30 seconds after the last key was pressed.
- The “Main Menu” page will allow the user to navigate to all other pages or sub-menus by using the Left/Right and Enter keys. This page can be accessed at any time with several presses of the dedicated Escape key. Each press of the Escape key takes you back to the previous menu until the main menu is reached. This page displays the following options: HISTORY; STATUS; EDIT; AND DEBUG. (See the Appendix - "Menu System".)

3.2 AUTOMATIC OPERATION

To select automatic operation, do the following:

1. Make sure the remote 2-wire contacts are set to their OPEN position.
2. Be sure that normal battery charger power source voltage is available to terminal lugs T1 and Neutral (Refer to the Electrical Data section).
3. Set the generator’s AUTO/OFF/MANUAL switch to AUTO.
4. Set the generator’s main circuit breaker to its ON (or CLOSED) position.

With the preceding steps complete, the generator will start automatically when remote 2-wire start contacts are CLOSED (ON). After the unit starts, loads are transferred to the generator and charges the battery pack by the inverter system. Refer to the Sequence of Automatic Operation section.

3.3 SEQUENCE OF AUTOMATIC OPERATION

3.3.1 REMOTE START ON

- Initial Conditions: Generator in Auto, ready to run. When remote start contacts are CLOSED (ON), the engine will crank and start.
- After remote start contacts OPEN (OFF), the engine will shut down after one (1) minute cool-down time.

3.3.2 CRANKING

The system will control the cyclic cranking as follows: 16 second crank, seven (7) second rest, 16 second crank, seven (7) second rest followed by three (3) additional cycles of seven (7) second cranks followed by seven (7) second rests.

Choke Operation

1. The 530cc engines have an electric choke on the stepper motor bracket that is automatically controlled by the electronic control board.

Failure to Start

This is defined as any of the following occurrences during cranking:

1. Not reaching starter dropout within the specified crank cycle. Starter dropout is defined as four (4) cycles at 1,000 RPM.
2. Reaching starter dropout, but then not reaching 2200 RPM within 15 seconds. In this case the control board will go into a rest cycle for seven (7) seconds, then continue the rest of the crank cycle.

During a rest cycle the start and fuel outputs are de-energized and the magneto output is shorted to ground.

Cranking Conditions

The following notes apply during cranking cycle.

1. Starter motor will not engage within five (5) seconds of the engine shutting down.
2. The fuel output will not be energized with the starter.
3. The starter and magneto outputs will be energized together.
4. Once the starter is energized the control board will begin looking for engine rotation. If it does not see an RPM signal within three (3) seconds it will shut down and latch out on RPM sensor loss.
5. Once the control board sees an RPM signal it will energize the fuel solenoid, drive the throttle open and continue the crank sequence.
6. Starter motor will disengage when speed reaches starter dropout.
7. If the generator does not reach 2200 RPM within 15 seconds, re-crank cycle will occur.
8. If engine stops turning between starter dropout and 2200 RPM, the board will go into a rest cycle for seven (7) seconds then re-crank (if additional crank cycles exist).
9. Once started, the generator will wait for a hold-off period before starting to monitor oil pressure and oil temperature (refer to the Alarm Messages section for hold-off times).
10. During Manual start cranking, if the Mode switch is moved from the Manual position, the cranking stops immediately.
11. During Auto mode cranking, if the remote start contacts OPEN (OFF), the cranking cycle does NOT abort but continues until complete. Once the engine starts, it will run for one (1) minute, then shut down.

3.3.4 REMOTE START OFF

Initial Condition: Generator supplying power to customer load. Once the contacts open, the controller will run the engine through a one (1) minute cool down period and then shut down.

3.4 SIDE COMPARTMENT

(FIGURES 3.2 & 3.3)

Local codes may require this compartment to be locked. A hasp is provided so the owner can secure the compartment with their own padlock. Check local codes in the area.

3.4.1 MAIN CIRCUIT BREAKER

This is a 1-pole breaker rated according to the Specifications section.

Figure 3.2 – Side Compartment

Figure 3.3 – Open Side Compartment

3.5 PROTECTION SYSTEMS

3.5.1 ALARMS

Highest Priority (Latching) Displayed on the control panel. They must be cleared before the alarm message goes away. The alarm log records each occurrence (see Appendix - "Menu System").

Low Oil Pressure (Shutdown Alarm)

A five (5) second delay on start-up and seven (7) second delay once the engine is running.

This switch (Figure 3.4) has normally closed contacts that are held open by engine oil pressure during operation. Should the oil pressure drop below the five (5) PSI range, switch contacts close and the engine shuts down. The unit should not be restarted until oil level is verified.

High Engine Temperature (Shutdown Alarm – Auto Reset)

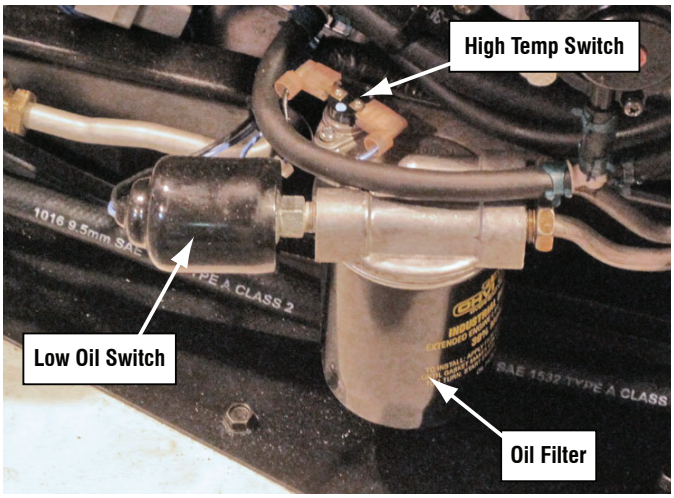
A 10 second delay on start-up and one (1) second delay before shutdown. Auto reset when the condition clears and restart the engine if a valid start signal is still present.

This switch's contacts (Figure 3.4) close if the temperature should exceed approximately 140° C (284° F), initiating an engine shutdown. Once the oil temperature drops to a safe level the switch's contacts open again.

Over Crank (Shutdown Alarm)

This occurs if the engine has not started within the specified crank cycle. (See "Cranking" section.)

Figure 3. 4 – Low Oil Pressure and High Temperature Switches



Over Speed (Shutdown Alarm)

3000 RPM for three (3) seconds or 3300 RPM immediately. This feature protects the generator from damage by shutting it down if it happens to run faster than the preset limit. This protection also prevents the generator from supplying an output that could potentially damage appliances connected to the generator circuit. Contact the nearest Dealer if this failure occurs.

RPM Sense Loss (Shutdown Alarm)

During cranking, if the Control Board does not see a valid RPM signal within three (3) seconds, it will shut down and lock out on RPM sense loss. While engine is running, if RPM signal is lost for one (1) second the Control Board will shut the engine down, wait 15 seconds, then re-crank the engine. If no RPM signal is detected within the first three (3) seconds of cranking, the Control Board will shut the engine down and latch out on RPM sensor loss. If the RPM signal is detected, the engine will start and run normally. If the RPM signal is subsequently lost again, the Control Board will try one more re-crank attempt before latching out and displaying the RPM sensor failure message.

Under-frequency (Shutdown Alarm)

After starting, if the generator stays under frequency for more than 30 seconds it will shut down. The under-frequency setting is 55 Hz.

Internal Fault (Shutdown Alarm)

This alarm cannot be cleared, call service dealer.

Undervoltage (Shutdown Alarm)

If the generator voltage falls below 85% of nominal for more than 15 seconds, it shuts down.

Overvoltage (Shutdown Alarm)

If the generator voltage rises above 110% of rating for greater than three (3) seconds, an alarm will be issued and the unit will shut down.

If the generator voltage rises above 130% of rating for greater than 0.5 seconds, an alarm will be issued and the unit will shut down.

Clear Alarm

Clear the alarm by setting the AUTO/OFF/MANUAL switch to the OFF position. Press the ENTER key to unlatch any active fault and clear the corresponding alarm message.

3.5.2 WARNINGS

Second Priority (Non-latching) Displayed on the control panel and the external yellow LED (V-twins only). Warnings automatically clear when the monitored condition goes away. Warnings are recorded in the alarm log. Warnings cannot cause shutdowns.

Low Battery

The Control Board monitors battery voltage and displays a warning if the battery voltage falls below 11.9 volts for one (1) minute. Warning is automatically cleared if the battery voltage rises above 12.4 volts. Battery voltage is not monitored during the crank cycle.

3.5.3 MAINTENANCE ALERTS

Third priority

Maintenance Message

When a maintenance period expires, a warning message will be displayed. The alert can be reset by pressing the Enter key, which will cause the user to be prompted to confirm the action. Resetting will clear the alert and reset the maintenance counters for all conditions annunciated. The history log will record the alert. The maintenance counter will not accumulate without battery power. Once battery power is restored, the set time prompt will be displayed. The maintenance counters will be adjusted to the new time and date.

NOTE:

Since most maintenance alerts will occur at the same time (most have 500 hour or two (2) year intervals), only one will appear on the display at any one time. Once the first alert is cleared, the next active alert will be displayed.

4.1 FUSE

The 7.5 amp fuse on the control panel protects the DC control circuit against overload (Figures 3.1 and 3.2). This fuse is wired in series with the battery output lead to the panel. If this fuse element has melted open, the engine will not be able to crank or start. Replace this fuse using only an identical 7.5 amp replacement fuse. Whenever the fuse is removed or replaced, the exercise timer needs to be reset.

4.2 CHECKING THE ENGINE OIL LEVEL

For oil capacities, see the Specifications section. For engine oil recommendations, see the Engine Oil Recommendations section.

When low battery levels necessitate running the generator for extended periods of time, the oil level should be checked weekly.

To check the engine oil level, proceed as follows (Figures 4.1, 4.2 and 4.3):

1. If the generator is running, first turn OFF all associated loads running in the residence. Second, turn the generator's main circuit breaker to the OFF position.
2. Move the AUTO/OFF/MANUAL switch to the OFF position.
3. Remove the dipstick and wipe it dry with a clean cloth.
4. Completely insert the dipstick; then, remove it again. The oil level should be at the dipstick “Full” mark. If necessary, add oil to the “Full” mark only. DO NOT FILL ABOVE THE “FULL” MARK.
5. Install the dipstick.
6. Reset the AUTO/OFF/MANUAL switch to its original position.
7. If the generator was running, first turn the generator's main circuit breaker back to the ON position. Second, turn ON needed loads in the residence.

* Repeat steps 3 through 5 for the oil reservoir.

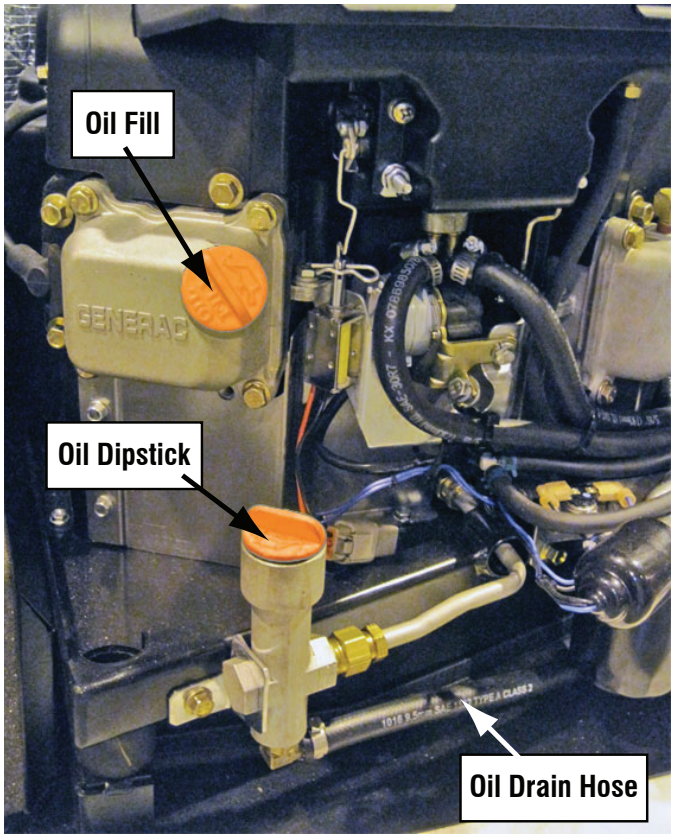
⚠ CAUTION!

Never operate the engine with the oil level below the “Add” mark on the dipstick. Doing this could damage the engine.

NOTE:

When checking the oil level in the reservoir, it is normal that the oil is steadily consumed, especially for the first 500 hours. At the first service interval, the oil level in the reservoir will likely be near the bottom of the dipstick. It is important that the engine oil level remains within the limits of the dipstick.

Figure 4.1 — Oil Dipstick and Fill



4.3 CHANGING THE ENGINE OIL

⚠ CAUTION!

Hot oil may cause burns. Allow engine to cool before draining oil. Avoid prolonged or repeated skin exposure with used oil. Thoroughly wash exposed areas with soap.

4.3.1 OIL CHANGE INTERVALS

See the "Service Schedule" section.

4.3.2 ENGINE OIL RECOMMENDATIONS

All oil should meet minimum American Petroleum Institute (API) Service Class SJ, SL or better. Use no special additives. Synthetic 5W-30 is used under all conditions.

⚠ CAUTION!

Any attempt to crank or start the engine before it has been properly serviced with the recommended oil may result in an engine failure.

4.3.3 OIL & OIL FILTER CHANGE PROCEDURE

To change the oil, proceed as follows:

1. Start the engine by moving the AUTO/OFF/MANUAL switch to MANUAL and run until it is thoroughly warmed up. Then shut OFF the engine by moving the switch to the OFF position.
2. Immediately after the engine shuts OFF, pull the oil drain hose (Figure 4.1) free of its retaining clip. Remove the cap from the hose and drain the oil into a suitable container.
3. After the oil has drained, replace the cap onto the end of the oil drain hose. Retain the hose in the clip.

Change the engine oil filter as follows:

1. With the oil drained, remove the old oil filter by turning it counterclockwise.
2. Apply a light coating of clean engine oil to the gasket of the new filter. See the Specifications section for recommended filter.
3. Screw the new filter on by hand until its gasket lightly contacts the oil filter adapter. Then, tighten the filter an additional 3/4 to one turn (Figure 3.4).
4. Refill with the proper recommended oil (see the Engine Oil Recommendations section). See the Specifications section for oil capacities.
5. Start the engine, run for one (1) minute, and check for leaks.
6. Shutdown and recheck oil level, add as needed. DO NOT OVER FILL.
7. Reset the AUTO/OFF/MANUAL switch to the AUTO position.
8. Dispose of used oil at a proper collection center.

* Repeat steps 2 and 3 for the oil reservoir.

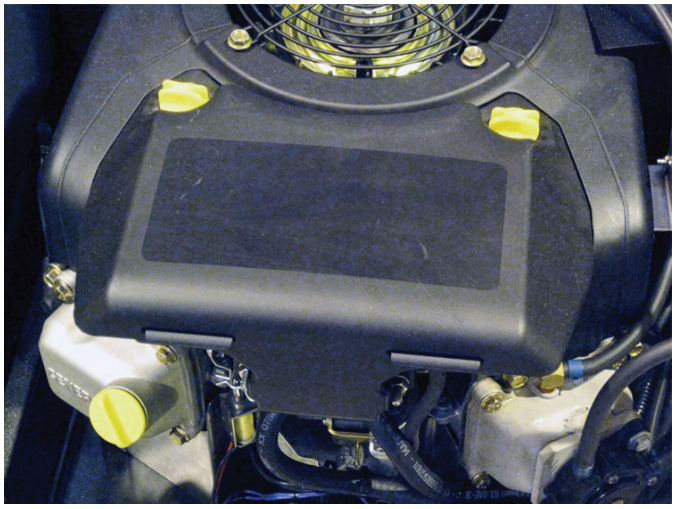
4.4 CHANGING THE ENGINE AIR CLEANER

See "The Generator" section for the location of the air cleaner. Use the following procedures (Figure 4.2):

1. Lift the roof and remove the door.
2. Turn the two screws 1/4 turn counterclockwise to loosen.
3. Remove the cover and air filter.
4. Wipe away dust or debris from inside of the air box and around edges.
5. Install the new air cleaner into the air box.
6. Install the cover. Turn the two cover screws 1/4 turn clockwise to tighten.

See the Service Schedule section for air cleaner maintenance. See the Specifications section for air filter replacement part number.

Figure 4.2 — Engine Air Cleaner

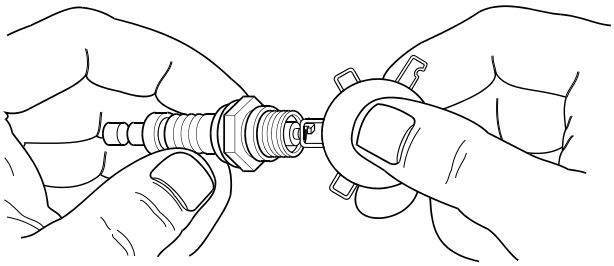


4.5 SPARK PLUGS

Reset the spark plugs gap or replace the spark plugs as necessary. See the Service Schedule section for maintenance requirements.

1. Clean the area around the base of the spark plugs to keep dirt and debris out of the engine.
2. Remove the spark plugs and check the condition. Replace the spark plugs if worn or if reuse is questionable. See the Service Schedule section for recommended inspection. Clean by scraping or washing using a wire brush and commercial solvent. Do not blast the spark plugs to clean.
3. Check the spark plug gap using a wire feeler gauge. Adjust the gap to 0.76 mm (0.030 inch) by carefully bending the ground electrode (Figure 4.3).

Figure 4.3 – Setting the Spark Plug Gap



4.6 BATTERY MAINTENANCE

The battery should be inspected per the "Service Schedule" section. The following procedure should be followed for inspection:

1. Inspect the battery posts and cables for tightness and corrosion. Tighten and clean as necessary.
2. Check the battery fluid level of unsealed batteries and, if necessary, fill with Distilled Water Only. Do not use tap water in batteries.
3. Have the state of charge and condition checked. This should be done with an automotive-type battery hydrometer.

⚠ DANGER!

Do not dispose of the battery in a fire. The battery is capable of exploding.

A battery presents a risk of electrical shock and high short circuit current. The following precautions are to be observed when working on batteries:

- **Remove the 7.5A fuse from the generator control panel.**
- **Remove watches, rings or other metal objects.**
- **Use tools with insulated handles.**
- **Wear rubber gloves and boots.**
- **Do not lay tools or metal parts on top of the battery.**
- **Disconnect charging source prior to connecting or disconnecting battery terminals.**

⚠ WARNING!

Do not open or mutilate the battery. Released electrolyte has been known to be harmful to the skin and eyes, and to be toxic.

The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. The following procedures are to be observed:

- **Wear full eye protection and protective clothing.**
- **Where electrolyte contacts the skin, wash it off immediately with water.**
- **Where electrolyte contacts the eyes, flush thoroughly and immediately with water and seek medical attention.**
- **Spilled electrolyte is to be washed down with an acid neutralizing agent. A common practice is to use a solution of 1 pound (500 grams) bicarbonate of soda to 1 gallon (4 liters) of water. The bicarbonate of soda solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water and the area dried.**

Lead-acid batteries present a risk of fire because they generate hydrogen gas. The following procedures are to be followed:

- **DO NOT SMOKE when near the battery.**
- **DO NOT cause flame or spark in battery area.**
- **Discharge static electricity from body before touching the battery by first touching a grounded metal surface.**

Be sure the AUTO/OFF/MANUAL switch is set to the OFF position before connecting the battery cables. If the switch is set to AUTO or MANUAL, the generator can crank and start as soon as the battery cables are connected.

Be sure the utility power supply is turned off and the 7.5A fuse is removed from the generator control panel, or sparking may occur at the battery posts as the cables are attached and cause an explosion.

4.7 ADJUSTING GT-530 VALVE CLEARANCE

After the first six (6) months of operation or 500 hours of operation, check the valve clearance in the engine, adjust if necessary.

Important: If feeling uncomfortable about doing this procedure or the proper tools are not available, please contact the Dealer for service assistance. This is a very important step to ensure longest life for the engine.

To check valve clearance:

- The engine should be cool before checking. If valve clearance is 0.002" - 0.004" (0.05 - 0.1mm), adjustment is not needed.
- Remove spark plug wires and position wires away from plugs.
- Remove spark plugs.
- Make sure the piston is at Top Dead Center (TDC) of its compression stroke (both valves closed). To get the piston at TDC, remove the intake screen at the front of the engine to gain access to the flywheel nut. Use a large socket and socket wrench to rotate the nut and hence the engine in a clockwise direction. While watching the piston through the spark plug hole. The piston should move up and down. The piston is at TDC when it is at its highest point of travel.

To adjust valve clearance (if necessary), (Figure 4.4):

- Make sure the engine is at 60° to 80° F.
- Make sure that the spark plug wire is removed from the spark plug and out of the way.
- Remove the four screws attaching the valve cover.
- Loosen the rocker jam nut. Use a 10mm allen wrench to turn the pivot ball stud while checking clearance between the rocker arm and the valve stem with a feeler gauge. Correct clearance is 0.002-0.004 inch (0.05-0.1 mm).

NOTE:

Hold the rocker arm jam nut in place as the pivot ball stud is turned.

When valve clearance is correct, hold the pivot ball stud in place with the allen wrench and tighten the rocker arm jam nut. Tighten the jam nut to 174 in/lbs. torque. After tightening the jam nut, recheck valve clearance to make sure it did not change.

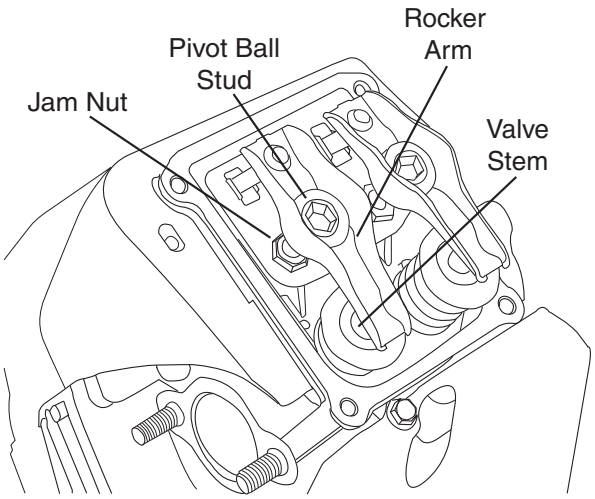
- Install new valve cover gasket.
- Re-attach the valve cover.

NOTE:

Start all four screws before tightening or it will not be possible to get all the screws in place. Make sure the valve cover gasket is in place.

- Install spark plugs.
- Re-attach the spark plug wire to the spark plug.
- Repeat the process for the other cylinder.

Figure 4.4 - Valve Clearance Adjustment



4.8 COOLING SYSTEM

Air inlet and outlet openings in the generator compartment must be open and unobstructed for continued proper operation. This includes such obstructions as high grass, weeds, brush, leaves and snow.

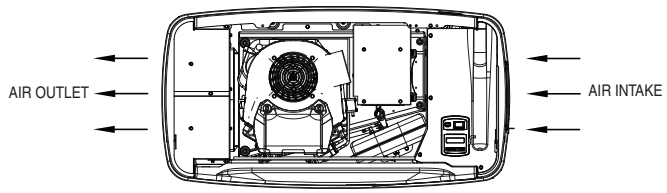
Without sufficient cooling and ventilating air flow, the engine/generator quickly overheats, which causes it to quickly shut down (Figure 4.5).

Make sure the doors and roof are in place during operation as running the generator with them removed can effect cooling air movement.

⚠WARNING!

⚠ The exhaust from this product gets extremely hot and remains hot after shutdown. High grass, weeds, brush, leaves, etc. must remain clear of the exhaust. Such materials may ignite and burn from the heat of the exhaust system.

Figure 4.5 – Cooling Vent Locations



4.9 ATTENTION AFTER SUBMERSION

If the generator has been submerged in water, it **MUST NOT** be started and operated. Following any submersion in water, have a Dealer thoroughly clean, dry and inspect the generator. If the structure (ex. home) has been flooded, it should be inspected by a certified electrician to ensure there won't be any electrical problems during generator operation or when utility is returned.

4.10 CORROSION PROTECTION

Periodically wash and wax the enclosure using automotive type products. Frequent washing is recommended in salt water/coastal areas. Spray engine linkages with a light oil such as WD-40.

4.11 OUT OF SERVICE PROCEDURE

4.11.1 REMOVAL FROM SERVICE

If the generator cannot be exercised every seven days, and will be out of service longer than 90 days, prepare the generator for storage as follows:

1. Start the engine and let it warm up.
2. Close the fuel shutoff valve in the fuel supply line and allow the unit to shut down.
3. Once the unit has shut down, switch to the OFF position.
4. Set the generator's main circuit breaker to its OFF (or OPEN) position.
5. Set the AUTO/OFF/MANUAL switch to OFF and turn off the utility power to the transfer switch. Remove the 7.5A fuse from the generator control panel. Disconnect the battery cables as outlined in "General Hazards".
6. While the engine is still warm from running, drain the oil completely. Refill the crankcase with oil. See "Engine Oil Recommendations". Drain the oil reservoir and refill with recommended oil to the proper level.
7. Attach a tag to the engine indicating the viscosity and classification of the oil in the crankcase.
8. Remove the spark plugs and spray fogging agent into the spark plugs threaded openings. Reinstall and tighten the spark plugs.
9. Remove the battery and store it in a cool, dry room on a wooden board. Never store the battery on any concrete or earthen floor.
10. Clean and wipe the entire generator.

4.11.2 RETURN TO SERVICE

To return the unit to service after storage, proceed as follows:

1. Verify that utility power is turned off and that the AUTO/OFF/MANUAL switch is set to OFF.
2. Check the tag on the engine for oil viscosity and classification. Verify that the correct recommended oil is used in the engine (see the Engine Oil Recommendations section). If necessary, drain and refill with the proper oil.
3. Check the state of the battery. Fill all cells of unsealed batteries to the proper level with distilled water. DO NOT USE TAP WATER IN THE BATTERY. Recharge the battery to 100 percent state of charge, or, if defective, replace the battery. See "Specifications," for type and size.
4. Clean and wipe the entire generator.
5. Make sure the 7.5A fuse is removed from the generator control panel. Reconnect the battery. Observe battery polarity. Damage may occur if the battery is connected incorrectly.
6. Open the fuel shutoff valve.
7. Insert the 7.5A fuse into the generator control panel. Start the unit by moving the AUTO/OFF/MANUAL switch to MANUAL. Allow the unit to warm up thoroughly.
8. Stop the unit by setting the AUTO/OFF/MANUAL switch to OFF.
9. Turn on the utility power to the transfer switch.
10. Set the AUTO/OFF/MANUAL switch to AUTO.
11. The generator is now ready for service.

NOTE:

If the battery was dead or disconnected, the exercise timer, current date and time must be reset.

4.11.3 ACCESSORIES

There are performance enhancing accessories available for the air-cooled generators.

- **Cold Weather Kits** are recommended in areas where temperatures regularly fall below 32° F (0° C).
- **Scheduled Maintenance Kits** include all pieces necessary to perform maintenance on the generator along with oil recommendations.
- **The Remote Monitor System** is a wireless, indoor mounted, box that indicates generator run status and allows for exercise programing as well as provide maintenance reminders.
- **Touch-up Paint Kits** are very important to maintain the look and integrity of the generator enclosure. These kits include touch-up paint and instructions if the need should arise.

For more details on accessories, please contact a Dealer.

4.12 SERVICE SCHEDULE

ATTENTION: It is recommended that all service work be performed by the nearest Dealer.

SYSTEM/COMPONENT	PROCEDURE			FREQUENCY
X = Action R = Replace as Necessary * = Notify Dealer if Repair is Needed.	Inspect	Change	Clean	W = Weekly M = Monthly Y = Yearly
FUEL				
Fuel lines and connections*	X			M
LUBRICATION				
Oil level	X			W
Oil		X		2Y or 500 hours of operation.**
Oil filter		X		2Y or 500 hours of operation.**
COOLING				
Enclosure louvers	X		X	W
BATTERY				
Remove corrosion, ensure dryness	X		X	M
Clean and tighten battery terminals	X		X	M
Check charge state	X	R		EVERY 6 M
Electrolyte level	X	R		EVERY 6 M
ENGINE AND MOUNTING				
Air cleaner	X	R		2Y or 500 hours
Spark plug(s)	X	R		2Y or 500 hours
GENERAL CONDITION				
Vibration, Noise, Leakage, Temperature*	X			M
COMPLETE TUNE-UP*	TO BE COMPLETED BY A DEALER			2Y or 500 hours
ALTERNATOR				
Rotor Brushes		X		2,500 hours

*** Contact the nearest dealer for assistance if necessary.**

**** Change oil and filter every 500 hours or 2 years, whichever occurs first.**

5.1 TROUBLESHOOTING GUIDE

Problem	Cause	Correction
The engine will not crank.	1. Fuse blown.	1. Correct short circuit condition, replace 7.5A fuse in generator control panel.
	2. Loose, corroded or defective battery cables.	2. Tighten, clean or replace as necessary.
	3. Defective starter motor.	3. *
	4. Dead Battery.	4. Charge or replace battery.
The engine cranks but will not start.	1. Out of fuel.	1. Replenish fuel/Turn on fuel valve.
	2. Defective fuel solenoid (FS).	2. *
	3. Open #14 wire from engine control board.	3. *
	4. Fouled spark plug(s).	4. Clean, re-gap or replace plug(s).
	5. Valve lash out of adjustment.	5. Reset valve lash.
	6. Choke not operating.	6. Verify choke plate moves freely.
The engine starts hard and runs rough.	1. Air cleaner plugged or damaged.	1. Check, replace air cleaner.
	2. Fouled spark plug(s).	2. Clean, re-gap or replace plug(s).
	3. Fuel pressure incorrect.	3. Confirm fuel pressure to regulator is 10-12” water column (0.36-0.43 psi) for LP.
	4. Choke remains closed.	4. Verify choke solenoid moves freely.
The AUTO/OFF/MANUAL switch is set to OFF, but the engine continues to run.	1. Defective switch.	1. *
	2. AUTO/OFF/MANUAL switch wired incorrectly.	2. *
	3. Defective control board.	3. *
There is no AC output from the generator.	1. Main line circuit breaker is in the OFF (or OPEN) position.	1. Reset circuit breaker to ON (or CLOSED).
	2. Generator internal failure.	2. *
Unit consumes large amounts of oil.**	1. Engine over filled with oil.	1. Adjust oil to proper level.
	2. Improper type or viscosity of oil.	2. See "Engine Oil Recommendations".
	3. Damaged gasket, seal or hose.	3. Check for oil leaks.
	4. Engine breather defective.	4. *

*** Contact the nearest Dealer for assistance.**

**** Most of the oil may be consumed in the oil reservoir between 500 hour service intervals. This is especially true during the first 500 hours of use.**

6.1 MENU SYSTEM NAVIGATION

To get to the MENU, use the "Esc" key from any page. It may need to be pressed many times before getting to the menu page. The currently selected menu is displayed as a flashing word. Navigate to the menu required by using the +/- keys. When the menu required is flashing, press the ENTER key. Depending on the menu selected, there may be a list of choices presented. Use the same navigation method to select the the desired screen (refer to the Menu System diagram).

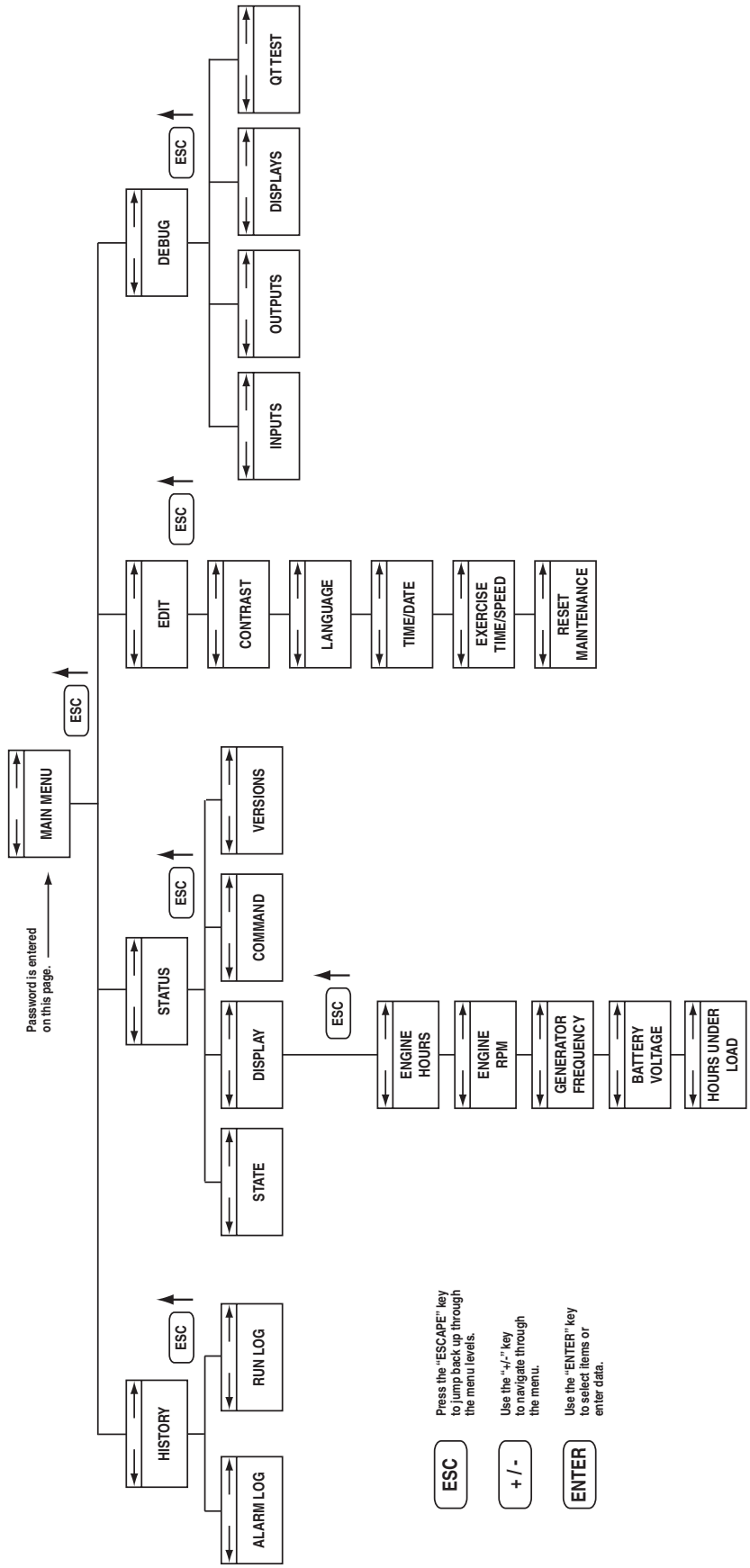
6.1.1 CHANGING SETTINGS (EDIT MENU)

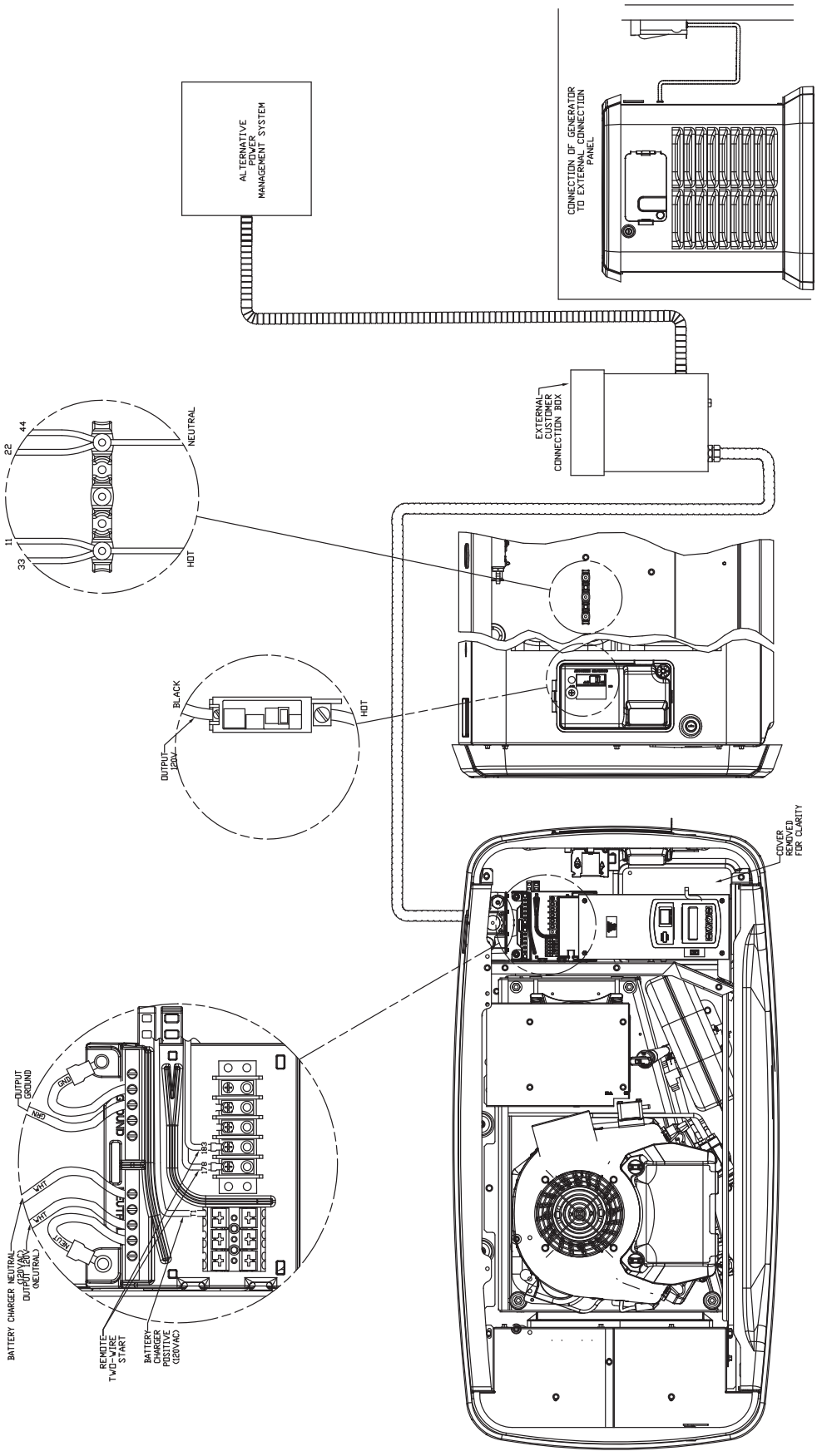
To change a setting such as display contrast, go to the EDIT menu and use the +/- keys to navigate to the setting to change. Once this setting is displayed (e.g. Contrast), press the ENTER key to go into the edit mode. Use the +/- keys to change the setting, press the ENTER key to store the new setting.

NOTE:

If the ENTER key is not pressed to save the new setting, it will only be saved temporarily. The next time the battery is disconnected, the setting will revert back to the old setting.

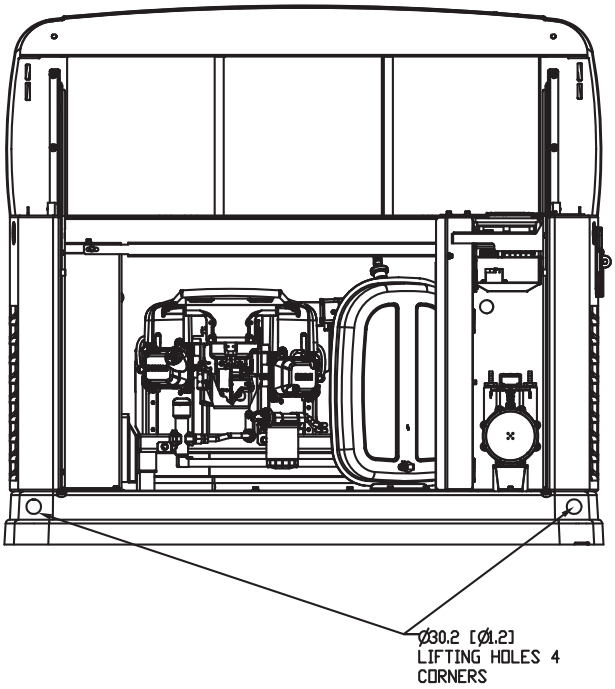
Appendix


Password is entered on this page.
MAIN MENU
ESC
HISTORY
ESC
ALARM LOG
RUN LOG
STATUS
ESC
STATE
DISPLAY
ESC
ENGINE HOURS
ENGINE RPM
GENERATOR FREQUENCY
BATTERY VOLTAGE
HOURS UNDER LOAD
COMMAND
VERSIONS
EDIT
ESC
CONTRAST
LANGUAGE
TIME/DATE
EXERCISE TIME/SPEED
RESET MAINTENANCE
DEBUG
ESC
INPUTS
OUTPUTS
DISPLAYS
QT TEST
ESC
Press the "ESCAPE" key to jump back up through the menu levels.
+ / -
Use the "+/-" key to navigate through the menu.
ENTER
Use the "ENTER" key to select items or enter data.

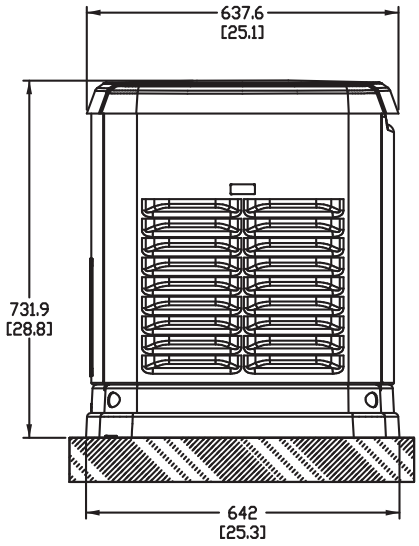

ALTERNATIVE POWER MANAGEMENT SYSTEM
CONNECTION OF GENERATOR TO EXTERNAL CONNECTION PANEL
EXTERNAL CUSTOMER CONNECTION BOX
22
44
11
33
NEUTRAL
HOT
BLACK
HOT
OUTPUT 120V
COVER REMOVED FOR CLARITY
OUTPUT GROUND
GND
NEUT
VHT
VHT
NEUT
BATTERY CHARGER NEUTRAL
AC INPUT 120V OUTPUT 120V (NEUTRAL)
REMOTE TWO-WIRE START
BATTERY CHARGER POSITIVE (12VDC)

Installation Diagram

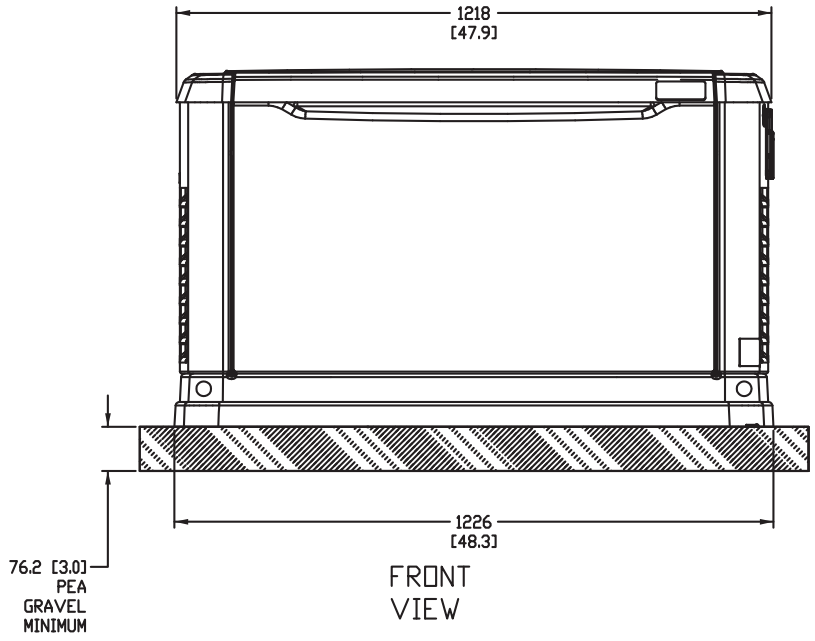
Drawing No. 0J1320-B



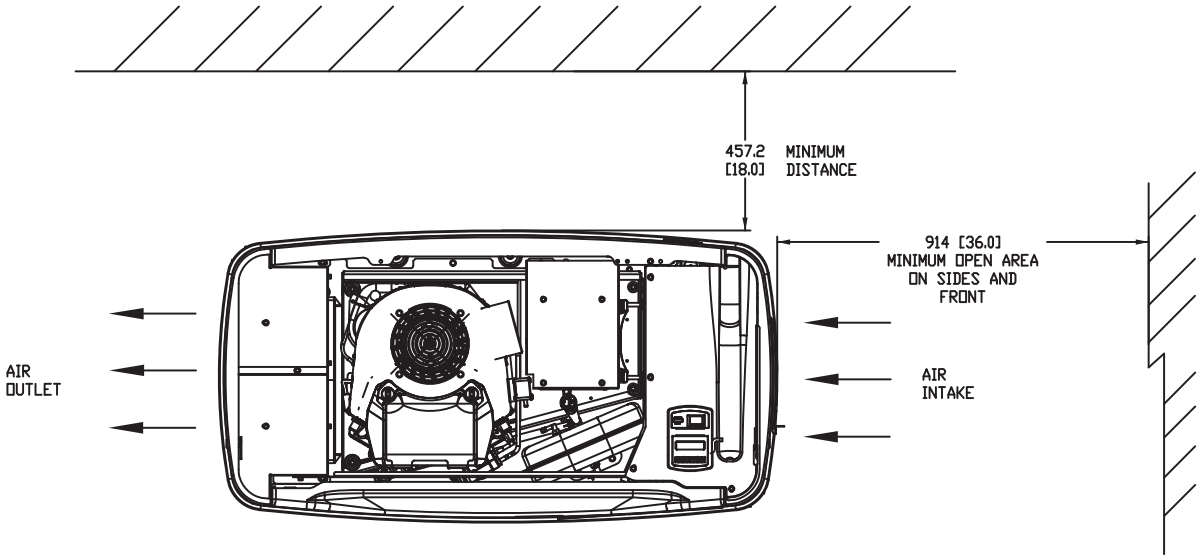
"DO NOT LIFT BY ROOF"

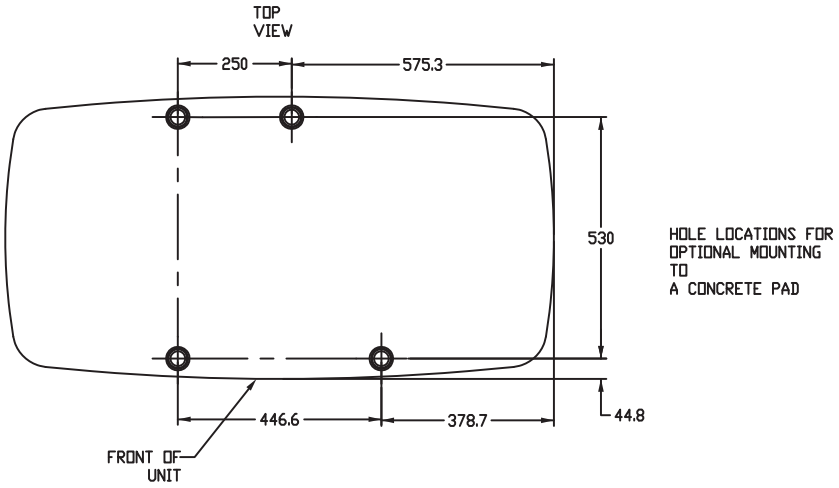


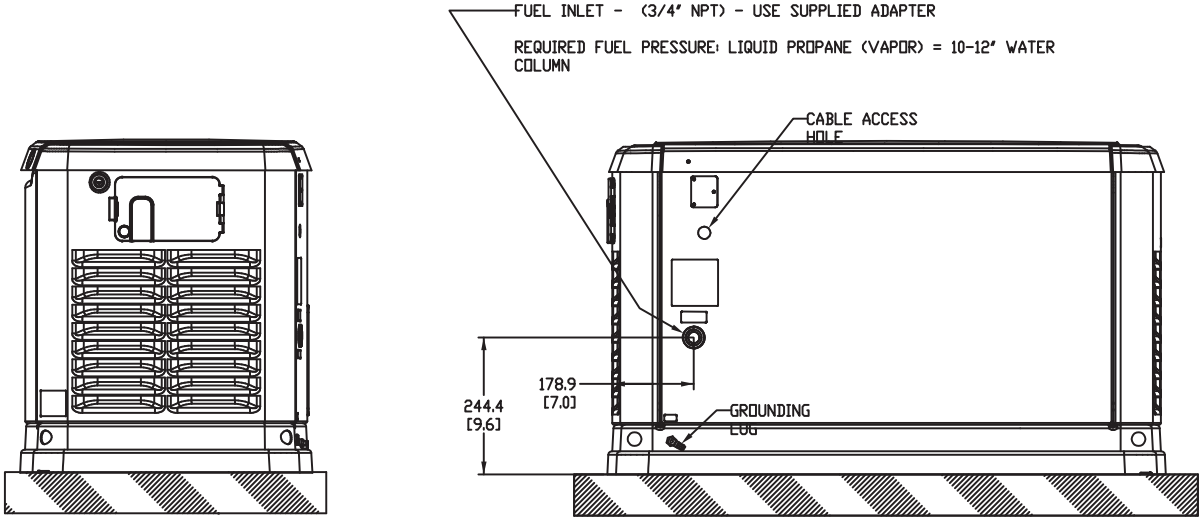
LEFT SIDE VIEW



FRONT VIEW





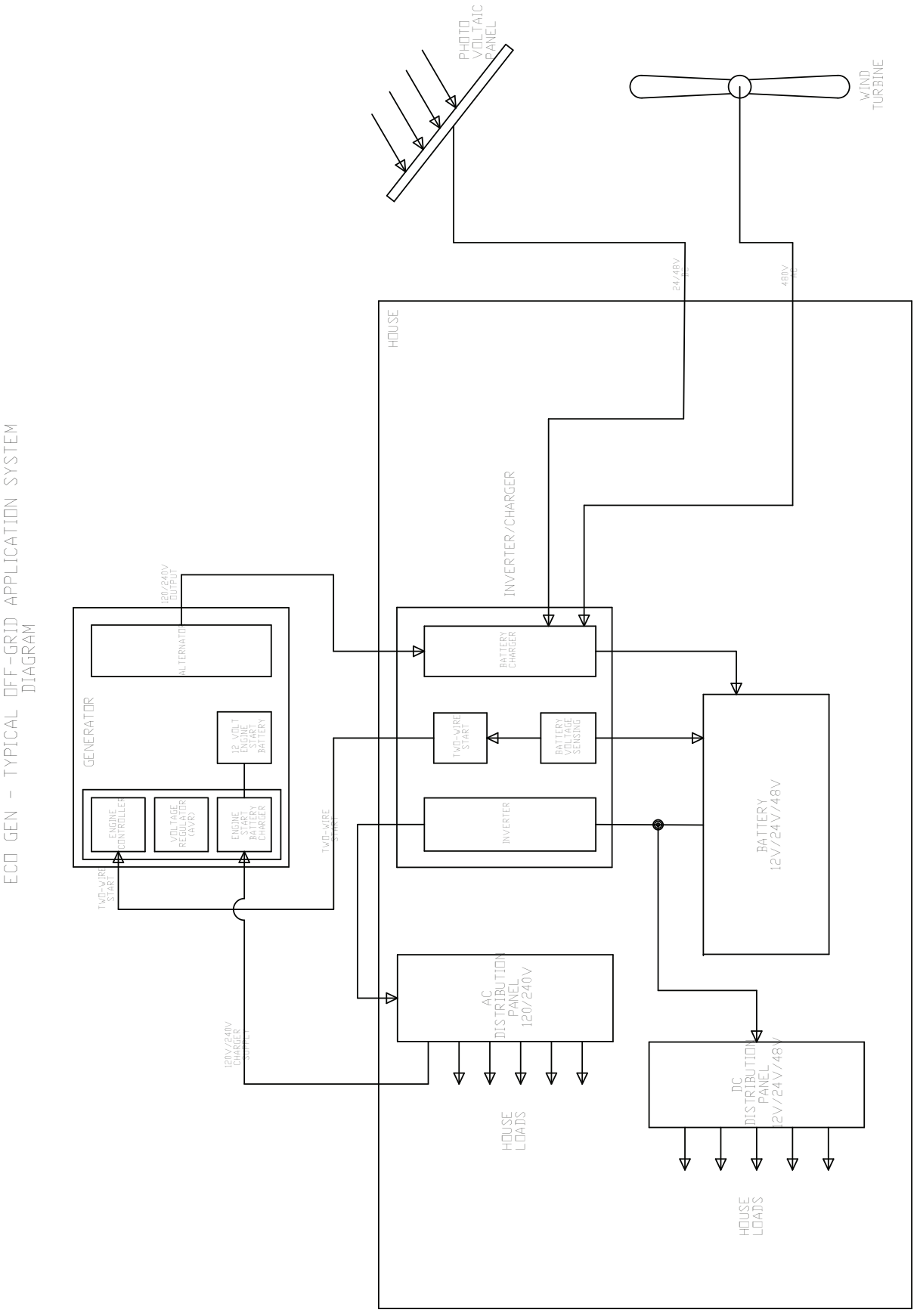

FUEL INLET - (3/4" NPT) - USE SUPPLIED ADAPTER
REQUIRED FUEL PRESSURE: LIQUID PROPANE (VAPOR) = 10-12" WATER COLUMN
CABLE ACCESS HOLE
178.9 [7.0]
244.4 [9.6]
GROUNDING LUG

RIGHT SIDE VIEW

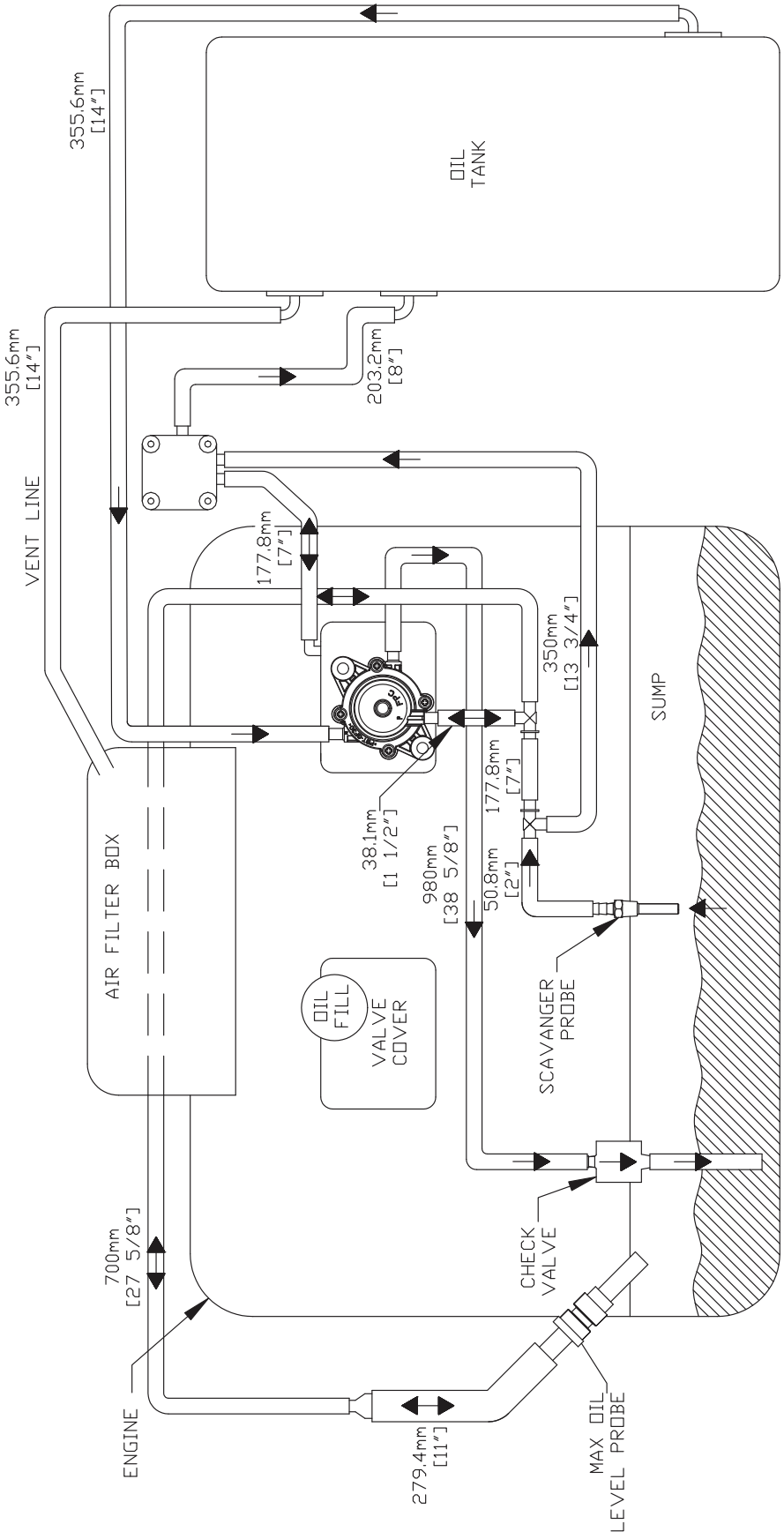
REAR VIEW

Installation Diagram

Drawing No. 0J1319-B



6kW ECO GEN
Oil Make-Up System
Not To Scale



Notes

Notes

Warranty

FOR GENERATORS 10KW AND BELOW

FEDERAL EMISSION CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

The United States Environmental Protection Agency (EPA) and Generac Power Systems, Inc. (Generac) are pleased to explain the Emission Control System warranty on your new 2008 and later equipment. New equipment that use small spark-ignited engines must be designed, built, and equipped to meet stringent anti-smog standards for the federal government. Generac will warrant the emission control system on your generator for the period of time listed below provided there has been no abuse, neglect, unapproved modification or improper maintenance of your equipment.
Your emission control system may include parts such as the: carburetor, ignition system, fuel system, catalytic converter, and other associated emission-related components (if equipped).

MANUFACTURER'S WARRANTY COVERAGE:

This emission control system is warranted for two years. If, during such warranty period, any emission-related part on your equipment is found to be defective in materials or workmanship, repairs or replacement will be performed by a Generac Authorized Warranty Service Dealer.

OWNER'S WARRANTY RESPONSIBILITIES:

As the generator owner, you are responsible for the completion of all required maintenance as listed in your factory supplied Owner's Manual. For warranty purposes, Generac recommends that you retain all receipts covering maintenance on your generator, but Generac cannot deny warranty solely due to the lack of receipts.

As the generator owner, you should be aware that Generac may deny any and/or all warranty coverage or responsibility if your generator, or a part/component thereof, has failed due to abuse, neglect, improper maintenance or unapproved modifications, or the use of counterfeit and/or "grey market" parts not made, supplied or approved by Generac.

You are responsible for contacting a Generac Authorized Warranty Dealer as soon as a problem occurs. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

Warranty service can be arranged by contacting either your selling dealer or a Generac Authorized Warranty Service Dealer. To locate the Generac Authorized Warranty Service Dealer nearest you, call our toll free number:

1-800-333-1322

IMPORTANT NOTE: This warranty statement explains your rights and obligations under the Emission Control System Warranty (ECS Warranty), which is provided to you by Generac pursuant to federal law. See also the "Generac Limited Warranties for Generac Power Systems, Inc.," which is enclosed herewith on a separate sheet, also provided to you by Generac. Note that this warranty shall not apply to any incidental, consequential or indirect damages caused by defects in materials or workmanship or any delay in repair or replacement of the defective part(s). This warranty is in place of all other warranties, expressed or implied. Specifically, Generac makes no other warranties as to the merchantability or fitness for a particular purpose. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

The ECS Warranty applies only to the emission control system of your new equipment. If there is any conflict in terms between the ECS Warranty and the Generac Warranty, the Generac Warranty shall apply. Both the ECS Warranty and the Generac Warranty describe important rights and obligations with respect to your new engine.

Warranty service can be performed only by a Generac Authorized Warranty Service Facility. When requesting warranty service, evidence must be presented showing the date of the sale to the original purchaser/owner.

If you have any questions regarding your warranty rights and responsibilities, you should contact Generac at the following address:

ATTENTION WARRANTY DEPARTMENT
GENERAC POWER SYSTEMS, INC.
P.O. BOX 297 • WHITEWATER, WI 53190

Part 1

Part No. 0H1911 Rev. A 01/09

EMISSION CONTROL SYSTEM WARRANTY

Emission Control System Warranty (ECS warranty) for equipment using small spark-ignited engines:

(a) Applicability: This warranty shall apply to equipment that uses small off-road engines. The ECS Warranty period shall begin on the date the new equipment is purchased by/delivered to its original, end-use purchaser/owner and shall continue for 24 consecutive months thereafter.

(b) General Emissions Warranty Coverage: Generac warrants to the original, end-use purchaser/owner of the new engine or equipment and to each subsequent purchaser/owner that the ECS when installed was:
  (1) Designed, built and equipped so as to conform with all applicable regulations; and
  (2) Free from defects in materials and workmanship which cause the failure of a warranted part at any time during the ECS Warranty Period.

(c) The warranty on emissions-related parts will be interpreted as follows:
  (1) Any warranted part that is not scheduled for replacement as required maintenance in the Owner's Manual shall be warranted for the ECS Warranty Period. If any such part fails during the ECS Warranty Period, it shall be repaired or replaced by Generac according to Subsection (4) below. Any such part repaired or replaced under the ECS Warranty shall be warranted for the remainder of the ECS Warranty Period.
  (2) Any warranted part that is scheduled only for regular inspection as specified in the Owner's Manual shall be warranted for the ECS Warranty Period. A statement in the Owner's Manual to the effect of "repair or replace as necessary" shall not reduce the ECS Warranty Period. Any such part repaired or replaced under the ECS Warranty shall be warranted for the remainder of the ECS Warranty Period.
  (3) Any warranted part that is scheduled for replacement as required maintenance in the Owner's Manual shall be warranted for the period of time prior to first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by Generac according to Subsection (4) below. Any such emissions-related part repaired or replaced under the ECS warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for that part.
  (4) Repair or replacement of any warranted, emissions-related part under this ECS Warranty shall be performed at no charge to the owner at a Generac Authorized Warranty Service Facility.
  (5) Notwithstanding the provisions of subsection (4) above, warranty services or repairs must be provided at Generac Authorized Service Facilities.
  (6) When the engine is inspected by a Generac Authorized Warranty Service Facility, the purchaser/owner shall not be held responsible for diagnostic costs if the repair is deemed warrantable.
  (7) Throughout the ECS Warranty Period, Generac shall maintain a supply of warranted emission-related parts sufficient to meet the expected demand for such parts.
  (8) Any Generac authorized and approved emission-related replacement parts may be used in the performance of any ECS warranty maintenance or repairs and will be provided without charge to the purchaser/owner. Such use shall not reduce Generac ECS Warranty obligations.
  (9) Unapproved, add-on, modified, counterfeit and/or "grey market" parts may not be used to modify or repair a Generac engine. Such use voids this ECS Warranty and shall be sufficient grounds for disallowing an ECS Warranty claim. Generac shall not be held liable hereunder for failures of any warranted parts of Generac equipment caused by the use of such an unapproved, add-on, modified, counterfeit and/or "grey market" part.

EMISSION RELATED PARTS MAY INCLUDE THE FOLLOWING (IF EQUIPPED):

1) FUEL METERING SYSTEM
   A. CARBURETOR AND INTERNAL PARTS
   B. PRESSURE REGULATOR
2) AIR INDUCTION SYSTEM
   A. INTAKE MANIFOLD
   B. AIR FILTER
3) IGNITION SYSTEM
   A. SPARK PLUGS
   B. IGNITION COILS / MODULE
4) AIR INJECTION SYSTEM
   A. PULSE AIR VALVE
5) EXHAUST SYSTEM
   A. CATALYST
   B. THERMAL REACTOR
   C. EXHAUST MANIFOLD

Part 2

Part No. 0H1911 Rev. A 01/09

Warranty

GENERAC POWER SYSTEMS LIMITED WARRANTY FOR "ECO GEN AIR-COOLED AUTOMATIC STANDBY GENERATORS"

For a period of three (3) years or 2000 hours, whichever comes first, from the date of original sale Generac Power Systems, Inc. (Generac) warrants that its standby generator will be free from defects in material and workmanship for the items and period set forth below. Generac will, at its option, repair or replace any part(s) which, upon examination, inspection and testing by Generac or an Authorized/Certified Generac Dealer, is found to be defective. Any equipment that the purchaser/owner claims to be defective must be examined by the nearest Authorized/Certified Generac Service Dealer. This warranty applies only to Generac emergency automatic standby generators used in "Standby" applications as Generac has defined Standby. This specific model of generator is intended to support alternative energy source systems that include an inverter, a battery bank, and an alternative energy source. Scheduled Maintenance, as outlined by the generator owner's manual, is highly recommended. This Scheduled Maintenance should be performed by an Authorized/Certified Generac Dealer. This will verify service has been performed on the unit throughout the warranty period.

WARRANTY SCHEDULE

UNITED STATES AND CANADA

YEARS ONE and TWO – A total of two (2) years or 2000 hours, whichever occurs first, limited comprehensive coverage on mileage, labor and parts listed.

- All COMPONENTS

YEAR THREE – Total of three (3) years or 2000 hours, whichever occurs first, coverage on parts listed.

- ALL COMPONENTS

INTERNATIONAL

YEAR ONE – A total of one (1) year or 1000 hours, whichever occurs first, coverage on labor and parts listed.

- All COMPONENTS

Extended Warranties are not available.

GUIDELINES

1. Warranty begins upon the successful registration of the unit.
2. Proof of Purchase and Maintenance must be available.
3. Warranty is transferable between ownership of original installation site.
4. Warranty only applies to permanently wired and mounted units.
5. Any and all warranty repairs and/or concerns, must be performed and/or addressed by an Authorized/Certified Generac Service Dealer, or branch thereof. Repairs or diagnostics performed by individuals other than Generac authorized dealers not authorized in writing by Generac will not be covered.
6. Steel enclosures are warranted against rusting for the first year of ownership only.
7. All warranty expense allowances are subject to the conditions defined in Generac's General Service Policy Manual.

THIS WARRANTY SHALL NOT APPLY TO THE FOLLOWING:

- Any unit built/manufacturer prior to September 2010.
- Generac generators that utilize non-Generac replacement parts.
- Costs of normal maintenance (i.e. tune-ups, associated part(s), adjustments, loose/leaking clamps, installation and start-up).
- Units sold, rated or used for "Prime Power", "Trailer Mounted" or "Rental Unit" applications as Generac has defined Prime Power, Trailer Mounted or Rental Unit. Contact a Generac Distributor for Prime Power, Trailer Mounted or Rental Unit definition.
- Damage to generator system caused by improper installation or costs necessary to correct installation.
- Units used for prime power in place of existing utility power (where utility power is present) or in place of utility power where utility power service does not normally exist without a renewable energy system including an inverter, battery bank and alternative energy power source.
- Fuel connections other than conventional utility company supplied conventional LP vapor withdrawal systems.
- Any failure caused by contaminated fuels, oils, coolants/antifreeze or lack of proper fuels, oils or coolants/antifreeze.
- Steel enclosures that are rusting due to the improper installation, location in a harsh or saltwater environment or scratched where integrity of paint applied is compromised.
- Failures due, but not limited, to normal wear and tear, accident, misuse, abuse, negligence or improper installation. As with all mechanical devices, the Generac engines need periodic part(s) service and replacement to perform as designed. This warranty will not cover repair when normal use has exhausted the life of a part(s) or engine.
- Failures caused by any external cause or act of God, such as collision, theft, vandalism, riot or wars, nuclear holocaust, fire, freezing, lightning, earthquake, windstorm, hail, volcanic eruption, water or flood, tornado or hurricane.
- Damage related to rodent and/or insect infestation.
- Products that are modified or altered in a manner not authorized by Generac in writing.
- Covered warranty labor rates are based on normal working hours. Overtime, holiday, or emergency labor costs for repairs outside of normal business hours will be the responsibility of the customer.
- Any incidental, consequential or indirect damages caused by defects in materials or workmanship, or any delay in repair or replacement of the defective part(s).
- Failure due to misapplication.
- Telephone, cellular phone, facsimile, internet access or other communication expenses.
- Living or travel expenses of person(s) performing service, except as specifically included within the terms of a specific unit warranty period.
- Expenses related to "customer instruction" or troubleshooting where no manufacturing defect is found.
- Rental equipment used while warranty repairs are being performed and/or overnight freight costs for replacement part(s).
- Costs incurred for equipment used for removal and/or reinstallation of generator, (i.e.; cranes, hoists, lifts, etc.)
- Planes, ferries, railroad, buses, helicopters, snowmobiles, snow-cats, off-road vehicles or any other mode of transport deemed abnormal.
- Starting batteries, fuses, light bulbs and engine fluids.

THIS WARRANTY IS IN PLACE OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. SPECIFICALLY, GENERAC MAKES NO OTHER WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Any implied warranties which are allowed by law, shall be limited in duration to the terms of the express warranty provided herein. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. GENERAC'S ONLY LIABILITY SHALL BE THE REPAIR OR REPLACEMENT OF PART(S) AS STATED ABOVE. IN NO EVENT SHALL GENERAC BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF SUCH DAMAGES ARE A DIRECT RESULT OF GENERAC'S NEGLIGENCE. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights. You also have other rights from state to state.

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To locate the nearest Authorized Dealer and to download schematics, exploded parts views and parts lists visit our website: www.generac.com

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